

Scanning -- Shortwave -- Satellites -- Ham Radio -- Computers -- Internet

Volume 20, No. 9

September 2001

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# Monitoring Times

Listening in  
on the  
Middle East

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Scanning Report





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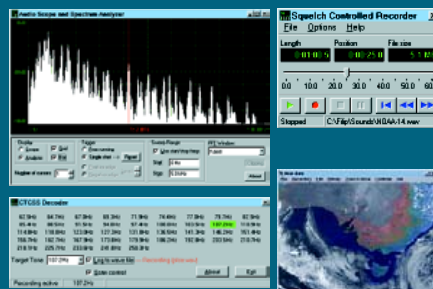
Introducing our Apple Macintosh support for the popular external WiNRADiO WR-1550e receiver. Frequency range 150 kHz to 1.5 GHz. (US version excludes cellular frequencies 825-849 & 869-894 MHz).



(Computer not included)

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Frequency	Location	Country	Class	Collage	Mode	Comments
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120.250 MHz	SAGINAW MICH	USA	Aviation	SAGINAW MICH RADIO	AM	
120.200 MHz	THEMPOUL WYO	USA	Aviation	THEMPOUL WYO RADIO	AM	
120.300 MHz	COCKLAND GSB	USA	Aviation	COCKLAND GSB RADIO	AM	
120.300 MHz	AUSTELL GA	USA	Aviation	AUSTELL GA RADIO	AM	
120.300 MHz	MARITTA GA	USA	Aviation	MARITTA GA RADIO	AM	
120.400 MHz	AUSTIN TEX	USA	Aviation	AUSTIN TEX RADIO	AM	
120.400 MHz	FLORENCE SC	USA	Aviation	FLORENCE SC RADIO	AM	
120.400 MHz	WINTERHART MO	USA	Aviation	WINTERHART MO RADIO	AM	
120.400 MHz	TOKOPHA NEV	USA	Aviation	TOKOPHA NEV RADIO	AM	
120.500 MHz	AUTUMN LA	USA	Aviation	AUTUMN LA RADIO	AM	

### PCMCIA Adaptor

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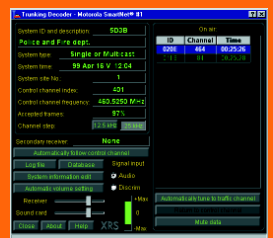
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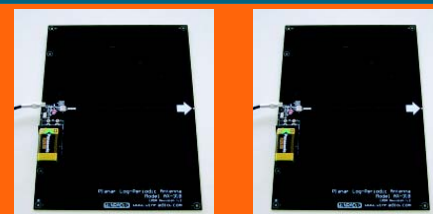


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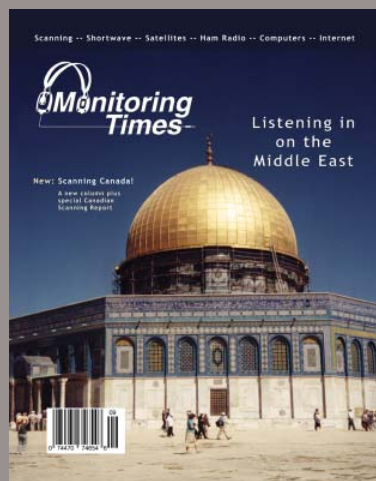


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[info@winradio.com](mailto:info@winradio.com)

# Monitoring Times

Vol. 20, No. 9 September 2001



On our Cover

## Listening in on the Middle East

By Dave White

An exotic world of mystery and intrigue is the picture painted of the Middle East by our lead features on listening and QSLing. Perhaps these Middle Eastern countries are mysterious only because we Westerners don't understand the culture and politics – and that's one reason for shortwave broadcasting. Each country would like the world to hear its side of the story, show off the best in its culture, or bring news and a taste of home to expatriates. Many of these countries are easy to hear, some are not easy, and some do not broadcast in English – and this, too, reflects the culture and politics of the country. Story starts on page 10.

One of the most hotly-contested sites in this religious cauldron is the Dome of the Rock, an Islamic temple built on the foundation of the ancient Jewish temple in Jerusalem. Photo by Bill Grove.

## QSLing the Middle East ..... 13

By Gayle Van Horn

Results vary as widely as the countries themselves when it comes to requesting a verification card. The task is made somewhat easier by the number of stations which provide current information via an internet address. The address directory at the end of this article provides some alternative routes through embassy connections as well.

## Fix It, Don't Toss It..... 18

By Arthur R. Lee

Most of us have thrown away something useful because it didn't work. Yet, often all it takes is a few minutes of your time to restore it to full use.

## Follow Trunked Systems by Computer ..... 19

By Mark Colborn

Just buying a trunk tracking scanner doesn't necessarily mean you can immediately tune in to your local system. You have to discover the frequencies in the system first. If it's a new or unknown trunked system, you can make a computer-controlled scanner do the investigative work for you, using freeware programs. How do you control your scanner by computer? The author will walk you through the process, using tips learned from Bill Cheek.

## Meet WJCR ..... 22

By Hans Johnson

This small, friendly, religious shortwave station in Upton, Kentucky, has a big dream for broadcasting to the world.

*Tiberius from the Sea of Galilee - Photo by Bill Grove*







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## Reviews:

Because of their small size and wide coverage, pocket receivers like the Icom R10, R2, and Yaesu VR-500 can be difficult to program. A much easier way to enter frequencies and perform programming tasks is to make your computer do the work. There are a variety of software packages available, but this month John Catalano looks at those from **RT Systems** (p.80).

The **Midland G-30 GMRS** radio has the best of both worlds – FRS channels and GMRS (without the use of repeaters). Check out Jock Elliott's review on page 87.

Since you can't see or hear radio waves with the naked ear or eye, one tool that can help you discern the frequency and character of the radio waves that surround you is the frequency counter. Bob Parnass tests a new, sophisticated counter from **Optoelectronics** – the **DS1000** (p.84).

Another workhorse on the test bench is the spectrum analyzer. Bob Grove reviews the **Blonder Tongue BTSA-8558C**, while he also explains why this comparatively expensive piece of equipment cannot function as a communications receiver (p.87).

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# The Digital Battle Against Satellite TV Pirates

DirecTV, the leading DBS (direct-broadcast-service) satellite provider, has declared all out war on high-tech "pirates" who steal television satellite signals. DirecTV, a unit of Hughes Electronics Corp., has about 10 million home satellite subscribers in the United States, and rival EchoStar Communications' DISH Network has about half that many. Subscription to satellite TV costs about \$50 a month ...and much more if you buy premium programming. People are constantly trying to eliminate the cost.

DBS receivers come equipped with a smart card with an embedded microchip that allows access to the system. When you subscribe to a satellite TV service, the card is programmed with downlinked code which permits the receiver to acquire only the channels that the subscriber has paid for, and leaves the rest scrambled. Each card has a unique identification number which is how the DBS service can add or remove programming from each individual card

## ◆ Satellite TV hacking is big business!

Some hackers buy set-top receivers from former subscribers or over the Internet to which they add an illegal smart card. Others specialize in reprogramming these cards or offering "emulation" software. Still others resell only set-top receivers without cards, which does not appear to be illegal in itself.

Reprogramming smart cards and offering "emulation software" is strictly outlawed. Some websites tell you about the existence of the software – some of it shareware or freeware – but leave it up to you to find it. A search engine on the Web usually does the trick.

Hackers can make a good living by selling illegal equipment, cards, and reprogramming services that gets around paying the subscription cost. Pirates charge up to \$350 for "cracked" cards so that the encrypted channels can be watched at no additional charge. Reportedly, the satellite industry loses more than \$6 million annually due to illegal piracy of its programming.

Reprogrammed "emulator" cards (which simulate the cards of legal services) are frequently made inactive by DBS providers using downlinked "seek and destroy" ECM (electronic counter measure) code, which sends the card's processor into an infinite loop, making it unprogrammable. An "unlooper" is a software program hackers have developed to fix cards that have been looped.

On "Black Sunday" (January 21st, 2001 – just a week before Super Bowl XXXV, the big-

gest viewing day of the year) DirecTV sent down a punishing series of ECM's including an amusing "Game Over" message. It made some 200,000 counterfeit cards unusable by not allowing them to be rewritten. It caused a massive run on rabbit ear antennas!

Not to be outdone, hackers designed a successful "bootloader," (which reprograms the cards) to circumvent the Black Sunday ECM. Now DirecTV has retaliated against the bootloader with a "hash" that makes them useless. The back and forth "cat-and-mouse" game continues. There are very bright engineers on both sides.

## ◆ Satellite TV pirates raided

The last week of June, in connection with lawsuits filed in U.S. District Court in California, DirecTV's Office of Signal Integrity with the assistance of U.S. Marshals raided several businesses and carted off "truckloads" of equipment used to reprogram DirecTV access cards and steal satellite programming.

The confiscation was made under civil-seizure and impoundment provisions of the *Digital Millennium Copyright Act of 1998 (DMCA)*, which makes it illegal to break a system used to protect digital content. The raid also resulted in the shutdown of several websites through restraining orders and preliminary injunctions. Firms located in Texas and Florida, as well as California were involved in the bust.

During the raids, officials also found customer lists. Satellite companies will now go after consumers as well who have purchased equipment, cards or software from the pirate companies. They will be asked to pay for the service they got and may be prosecuted if they don't.

There are at least two websites still operating that openly cater to those who are interested in accessing DirecTV and EchoStar programming: <http://www.HackHU.com/> and <http://www.dishnethack.net/>. They both report on the state of the DBS hacking art and operate on the fringe of legality. HU is DirecTV's latest generation of smart card which apparently can be rewritten with a standard smartcard programmer lashed to a PC's serial port.

DishNetHack says they "...do not condone signal theft, nor do we provide you the tools to do so." They have a password protected forum and exist financially by asking for donations which are paid by credit card direct to a secure "Pay Pal" credit card service.

Both <http://www.superdish.tv/> and a website at <http://64.65.21.8/> sell satellite "de-

vices" for "educational purposes only" and that any purchases must "only be used in a lawful manner." You must specifically agree not to use any information or purchased product illegally.

## ◆ Pirate FM Broadcaster Loses Ham, GMRS Licenses

The FCC has revoked both the GMRS (KAE1170) and General Class licenses of Leslie D. Brewer, KC4HAZ (Tampa, Florida) and fined him \$11,000 for repeatedly operating an FM "pirate radio" station and marketing "illegal" broadcast transmitting equipment. The commission concluded that Brewer "...lacks the basic character qualifications to be and remain a Commission licensee." Brewer owns a 2-way radio electronics shop in Tampa, Florida, and assembles radio equipment.

On January 10, 1996, FCC Tampa field office engineers traced a pirate FM station broadcasting on 102.1 MHz to Brewer's home. He was issued a warning about unlicensed operation. A month later, the FCC found him once again operating his unlicensed FM station. He was fined \$1,000, but he continued his pirate operations. When FM station WHPT-FM 102.5 MHz complained of interference, the FCC and U.S. Marshals Service raided his home on November 19, 1997, and confiscated his FM transmission equipment.

On November 8, 1999, while one of his applications was pending, Brewer resumed his unlicensed "pirate" broadcasts on 102.1 MHz. This time it was from a warehouse in a Tampa shopping mall. Monitoring indicated he was using an unlicensed studio-to-transmitter (STL) link on 950.0925 MHz to route the FM programming from his home to the warehouse.

In addition to operating pirate FM and STL facilities, Brewer also sold unauthorized FM broadcast transmitting equipment. During the fall of 1998, FCC undercover agents were able to purchase a 20-watt FM transmitter for \$560 from him. This resulted in another \$10,000 fine "...for selling an unauthorized radio frequency device."

A "Show Cause" order was issued on March 5, 2001, and Brewer was given an opportunity for a hearing. He failed to appear or respond and on June 26, 2001, the FCC released the revocation and forfeiture order.

"Operating unlicensed radio facilities in deliberate and brazen defiance of our rules cannot and will not be tolerated." FCC said. He was ordered to pay the \$11,000 fine within 30 days or face action by the Department of Justice.



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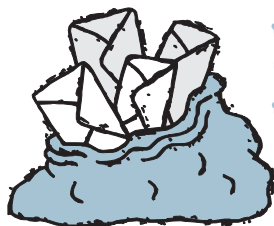
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# LETTERS TO THE EDITOR

## Welcome, Canada!

Several months ago we cast out some bait for Canadian readers and those near its borders to give us some "official" or otherwise reliable sources for Canadian scanning information. You can find the excellent list of reliable resources – mostly web sites – resulting from that appeal in this month's *Scanning Report* column. But better yet, we turned up a proficient writer and experienced hobbyist who has agreed to supply a *Canadian Scanning* page for the *Scanning Report* column every month!

John Corby has great plans for the "ScanCan" column, and you can read all about them on page 31. The column is replacing the spot usually held by *Service Search*, which may appear anywhere in the magazine as space is available. Welcome, John!

## Show Us Your Listening Post

"I see you have added a section that I really enjoy. It's where people send in photos of their home listening stations. I find all of them very interesting – be they home built or bought from a store. Please keep this section as a regular part of every issue!" – *SF*

We've always run listening post pictures whenever our readers send them in. Obviously it's something folks enjoy, so consider sending in your set-up! – *rb*

## Great review of IRhythm Tuner

"Many thanks for the thorough, extremely informative and helpful review, 'What is an

Internet Receiver/Tuner?' in the July *Computers & Radio* column. Thanks to John Catalano, I was able to determine that the product probably would be useful to me, figure out which version of the product to buy, and install the product successfully (including upgrading my Windows 98 to second edition before attempting the installation). Not a bad return for the investment of reading two pages!

"My impression is that, while you thought the product worked reasonably well and was 'fun to use,' you had some difficulty figuring out what the market was for it. Well, it fit my needs because my computer is in the basement, but I wanted to be able to listen to some Internet radio upstairs. I had known about the existence of the IRhythm system, but none of the company's promotional materials really explained how the product worked. I had therefore been reluctant to gamble \$100 just so I could listen to Internet radio more conveniently.

"Then two things happened: first, the unbelievable (and unconscionable!) BBC decision to scrap all its direct shortwave broadcasting of the World Service to North America, which would make me turn to their Internet broadcasts; then, your review.

"Thanks to you, I learned that what the system actually did was to broadcast a local signal from my computer to one of my radios, with a range of maybe 100 feet. I also got, generally, a sense of how the system functioned, and could check my computer for a USB port, and up-

grade my measly old Windows 98 to Second Edition, before the system ever got here.

"Then, when I went to the product's web site, there were two versions on sale. Since I wanted to send the broadcasts upstairs, I knew, thanks to you, that I needed the one with the pocket-sized receiver, too. Otherwise I probably would have picked the less expensive one and would have had to send it back. By the way, for my purchase, the web site referred me to Amazon.com, and with their discount I was only investing \$74.95 plus shipping on this experiment.

"Even with all your help, installation took me four tries and a lot of head-scratching. (It turned out that even though 98 2nd edition was essential, the driver that I needed was actually located on the W98 \*first\* edition CD-ROM.) Nevertheless, I did get it installed, and while I couldn't say it works perfectly, it gets the job done well enough, giving me lots more radio choices even when I'm not on the same floor as the computer. So, thank you very much for a first-rate review; I doubt that I would have tried the product or have gotten it to work without it.

"By the way, it's at least possible that someone in the company read your review, because, while they haven't cleared up all the misleading and confusing problems with terms, at least they aren't calling the system an Internet Radio 'Receiver' any more. It's now the IRhythm Remote Tuner at the web site and in the literature."

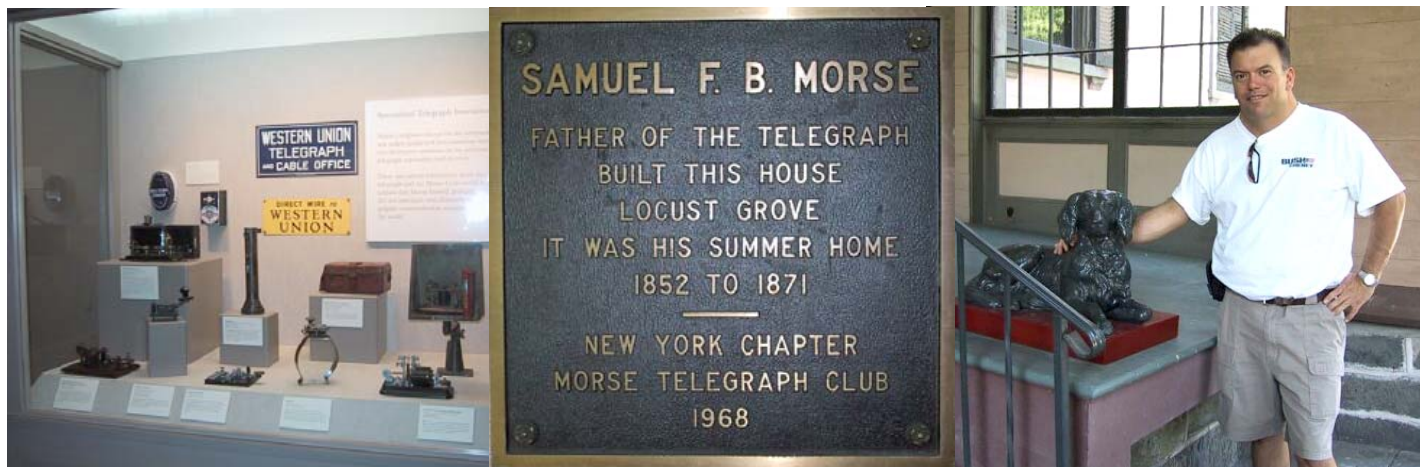
– Rhiman Rotz, Gary, Indiana

## Samuel Morse's Radio Shack?

"I had no idea that Samuel Morse, inventor of the Morse Code, was an accomplished professor of art. Here are photos from his estate, Locust Grove. The photos are exhibits inside of the visitor's center and the plaque on the house. In the fall the foliage must be awesome, and in winter the view of the Hudson must be magnificent.

"For more info on Locust Grove visit: <http://www.morsehistoricsite.org/index.html> It is about a 1 hr 45 minute ride from NYC by car and is two minutes from a neat ham radio store called "Ham Central."

– Ed Muro - K2EPM, Long Island, New York





## Bye-Bye BBC?

"Does the BBC really believe that internet and satellite broadcasts will replace shortwave services? My father bought a shortwave receiver primarily to listen to the BBC and at 78 years of age, has no plans to purchase internet or satellite radio service. The only FM rebroadcast in our area is on after 2:00am local time – much past my father's bedtime. I have sent a message to the BBC to relay my concerns about this decision."

— Rob Holman, email

To the BBC: "I am deeply disappointed at the BBC World Service for cutting shortwave service to North America. I listen to the BBC in my car on my hour-long drive to work every morning (I live near Toronto). News coverage on the BBC puts any North American broadcaster to shame. I have relied on the BBC to stay abreast of World news. North American broadcasters put out mainly local news which is of little interest to me.

"Local FM broadcasts amount to an abbreviated edition of the BBC news (5 minutes!) along with a half-hour program later in the day while I am at work (and unable to listen). On-line access to the BBC is useless to me in the office since my employer frowns on personal use of its bandwidth. At home I have only slow speed dialup access which is not very efficient for listening to radio broadcasts.

"The BBC has a huge following in North America which you have seriously underestimated. The World value of the BBC as an institution has been seriously compromised by the decision to abandon shortwave service to North America. Shame on you."

— John David Corby (MT's Canadian Scanning columnist)

"I have read with real interest about the BBC pulling the plug on shortwave broadcasts to the US and Canada. I am writing to let readers in the eastern US know that it is still possible to receive some broadcasts on shortwave from the BBC.

"It is still possible to receive the BBC every evening on 5975 kHz and every morning from 6-7 a.m. on 6195 kHz. I believe that both frequencies are broadcast from Antigua and are directed to Central and South America; however, I receive them loud and clear here in Brooklyn, New York. Incidentally, 6175 kHz which the BBC used to broadcast to North America every evening has been taken over by Radio Netherlands.

"I hope this information will be helpful to you readers who may be suffering from BBC shortwave withdrawal."

— Richard Statfield KZ2KDQ, Brooklyn, NY

## Do You Hear Singing?

"I saw the letter in the June *Ask Bob* column on singing power lines. When I was in grad school at Syracuse, one of my teaching jobs was to educate art students on general science as it might apply to art. The letter brought back a dim memory of wind harps (which was part of a section I taught on acoustics). As wind passes over a wire, it sets up vortices above and below.

This turbulence can cause the wire to vibrate IF the wind speed (and the resultant vibration from the shedding vortices) happens to match the wire length. Resultant vibration is not at the fundamental, but rather at higher harmonics. A quick search turned up <http://www.konzak.com/windharp/physics.html>. I think their explanation is pretty much the same.

"I can recall sitting outside a restaurant one night waiting for *Prairie Home Companion* to end on the car radio before going inside. When I turned off the radio I heard a very high pitched and LOUD tone. It was the power lines outside the restaurant responding to a steady ocean breeze. All this goes back too many years – better check out the sites."

— Dale Parfitt W4OP

We welcome your ideas, opinions, corrections, and additions in this column. Please mail to **Letters to the Editor**, PO Box 98, Brasstown, NC 28902, or email [mtditor@grove-ent.com](mailto:mtditor@grove-ent.com). Letters may be edited for length and clarity. Happy monitoring!

— Rachel Baughn, KE4OPD, editor

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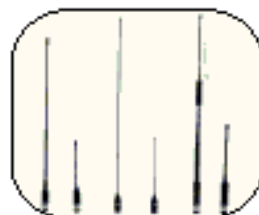
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## Cellphones a luxury?

Looks like we could have had a cellphone-type service in the car 20 or more years earlier if, back in 1947, the Federal Communications Commission hadn't deemed it "more in the nature of convenience or luxury" rather than in the public interest, and refused to allocate enough channels to make it worthwhile for manufacturers to develop the technology. Only when mobile-phone frequencies became totally congested did the FCC relent.

...Of course, now states are back-peddaling and trying to regulate how and when you can use phones in the car, "in the public interest." Maybe the FCC was right all along ...

## Good Uses for Old Phones

Before you throw away your old model cell phone, check to see if your local charities can make use of it. The Donate a Phone program was started by the Wireless Foundation, Motorola, and the National Coalition Against Domestic Violence. Refurbished phones are given to potential victims as a way to call for help in an emergency. Other programs such as TRIAD (National Sheriff's Association, International Association of Chiefs of Police, and AARP) are making cell phones available to the elderly for 911 calls. This program is taking advantage of the FCC regulation requiring the 911 calls be connected at no charge whether activated for paid service or not.

## Amtrak designates "quiet cars"

On most Amtrak trains traveling the Northeast corridor you can now choose a "quiet car" where no cell phones (or loud conversations) are allowed.

## Najaco World Flight

Two Saudi pilots are attempting to create a world record by flying to every country in the world, land in every continent, fly around the globe, and fly over every ocean – all in one expedition. The Najaco World Flight to all 198 countries of the world was to have begun in July but was delayed until August at last word. Captain Amer Khashoggi and copilot Imtiaz Shora will leave from Riyadh, Saudi Arabia, in a single engine aircraft, a Cessna Caravan C208B (callsign N837AK) for their record breaking flight, which

is expected to take about 6 months to complete! The purpose of the flight is stated as adventure, record-breaking, and to promote world peace. For more information visit <http://www.najaco.com>

## Robots to the Rescue

The father of robotics is planning for his retirement. Seventy-five year old Joe Engelberger is working on robotics to offset the shortage of caretakers for seniors who want to stay at home. "Barring an earlier end, I'll eventually become a handicapped," he says. "Everyone does."

University of South Florida Associate Professor Stuart Wilkinson has invented the world's first robot that creates its own energy by eating and digesting. Dubbed Gastronome, the robot currently eats only sugar which is broken down by E. coli bacteria, releasing electrons and charging the battery. The robot could be fueled with vegetation (a Science Fair demonstration I remember decades ago!), but the inventor hasn't yet solved the problem of waste elimination!

## NASA

The international Space Station has finally overcome a number of obstacles, from hardware problems to Russia's monetary crisis, to get itself ready for its mission as a sophisticated space-based research laboratory. In order to perform research, the intent was to house six or seven residents, but now that may not happen. NASA is over budget by about \$4 billion, and President Bush has slashed funding to a level that would only support the current crew of three members – sufficient to keep the station operational but not to perform significant research.

A. Thomas Young, who is heading an external review of the budget crunch, fears a downward spiral. "If you say, OK, we've only got a three-person crew, then it's easy to say we don't need all the science because the people can't operate the science." If the research and commercialization is eliminated, you can eliminate the US-funded living quarters for the larger crew. You also eliminate research and astronauts from the European Space Agency, Japanese Space Agency and Canadian Space Agency, who were counting on a full-size crew.

NASA did waste money on pursuing some dead-end projects, but do we really want a bigger, much more expensive version of *Mir* revolving around the earth for five years while NASA tries to balance its budget?

## Drowning in Information Age

On the other hand, what would NASA do with all that research data anyway? Every night NASA computers download more data from satellites and space missions. Even if the data was immediately put in line to be backed up, it could be more than 20 years before it is copied for future use.

However the lifetime of the tape is less than 20 years. Though the storage capacity of tapes has increased greatly, data transfer speeds have not.

The same problem will soon hit the European Space Agency, then agencies like the Social Security Administration and banks and insurance companies. We need a next-generation mass storage and retrieval system solution!

## Interplanetary Internet

NASA's Deep Space Network listens for signals from its satellites, but in the future, spacecraft may be able to talk to one another as well as to Earth. The Mars Odyssey, due to arrive at



### Aug 31-Sep3: Pittsburgh, PA

2001 National Radio Club and DX Audio Service Convention, Greentree Radisson (800-333-3333). Registration \$40 incl Sat buffet, Sun breakfast, snacks. Check or money order to John R. Malicky, 995 Shadycrest Road, Pittsburgh, PA 5216-3046. Speakers, DX quiz, infamous NRC auction, station tours.

### Sept 1-2: Shelby, NC

45th annual Shelby Hamfest at the Cleveland County Fairgrounds (intersection US74 Bus and NC180), Talk-in 146.28/88; Gates open 6am., \$6 adm covers both days. Dealers, exhibits, 15 acres of tailgating, camping, forums, awards, VE exams (walk-ins). For info John Ledford W4JL, 9555 Knob View Dr, Valen, NC 28168, 704-462-4910, [W4JL@shelby.net](mailto:W4JL@shelby.net) or visit <http://www.shelby.net/w4fan>. After Aug 26 call hamfest site 704-480-6928.

### Sept 28-30: Oakville, Ontario

Ontario DX Association RadioFest 2001 at Monte Carlo Inn (374 South Service Rd. E.). Fri reception; Sat displays and exhibits, guest speakers (Michael Caine, CHWO, and Neil Carleton), panel discussions, raffle drawing. Sunday CHWO studio tour. Registration \$10 (US\$7). For information, contact Harold Sellers at [905] 853-3518 / fax [905] 853 3169 or email at: [listeningin@home.com](mailto:listeningin@home.com) or Box 161, Willowdale Stn A, Toronto, Ontario, Canada M2N 5S8. Check <http://www.odxa.on.ca> for full schedule.

### Sept 7-9: Riverside, CA

ARRL SW Div Convention, sponsored by Inland Empire Council of Amateur Radio Organizations, located at the Riverside California Convention Center and the Holiday Inn. Full slate of programs and exhibits, guests, including SETI president Dr. Paul Shuch.

### Sept 14-16: Peoria, IL

Peoria Superfest sponsored by Peoria Area ARC at Exposition Gardens, talk-in 147.075 + Fri flea market preview 3pm to dark; live music Sat night, FCC testing Sunday 10a.m.-1p.m. Adm \$5 advance, \$7 at gate (covers all weekend). Visit <http://www.w9uvi.org> for latest info or email [w9uvi@arrl.net](mailto:w9uvi@arrl.net) (Peoria Superfest, PO Box 3508, Peoria, IL 61622-3508)

### September 16: Newtown, CT

Western CT hamfest sponsored by Candlewood ARA, at Edmond Town Hall (Rt 6 off I-84 Exit 10); Talk-in 146.67 (-) PL 100. 9am-2pm; Adm \$4. Tailgating (set-up 7am), ham and computer equipment, door prizes, refreshments. Contact Ken Weith KD1DD, 8a Hoyt Road, Bethel, CT 06801; 203-743-9181 or visit <http://www.danbury.org/cara>



NAJACO WORLD FLIGHT, IN ASSOCIATION WITH SAUDI PASSPORT AGENCY



Mars in October, carries the first component in such a vision. The Odyssey carries a short-range transceiver, enabling it to act as a relay. A probe on the surface could relay pictures and data to an orbiting satellite, which might send the data directly to Earth or to another satellite for relay. Making a multiple hop could also mean a back-up of data if lost in transit. The system could also allow mission controllers to send commands to other spacecraft.

## Funding for new SETI Project

Dr Paul Shuch is asking for contributions to help launch a new project in the Search for Extra-Terrestrial Intelligence. Shuch has designed a radio telescope array which will combine the power of multiple standard TV antennas into a single powerful telescope, but at a tiny fraction of the cost of the giant telescope at Green Bank, WV, for example. Array2k will have a collecting area of 2,000 square feet. To date the League has received significant donations, including a site in northern New Jersey on which to build the array. However, \$160,000 is needed just for hardware to get up and running. If you are interested in learning more about this project, please see the web-page at <http://www.setileague.org/array2k/update.htm> or write to The SETI League, 433 Liberty Street, Little Ferry, NJ 07643; 201-641-1770/1771 fax.

## Satellites Monitor Earth's Crust

A network of 250 little gray satellite monitoring stations is now standing on spindly legs all over Southern and Baja California. Using the GPS for positioning, the network can provide continuous data on the movement of the Earth's crust for the next 50 years, and help scientists assess the risk of an earthquake.

## Satellite Car Radio Slow to Start

"When we came into it we were neophytes. We were not Detroit people," said the chairman of Sirius Satellite Radio, who has found it easier to launch a satellite system than to get a radio into a car and onto the market. "We figured that they worked like the rest of the world." XM Satellite Radio Holdings Inc still hopes to get off the ground before the end of this year in two Cadillac models, but Sirius isn't likely to show up as an option in Ford models until sometime next year.

## Read the Fine Print

While many rental companies use the global positioning system (GPS) to give directions or track stolen cars, Acme Rent-A-Car goes a big step further. They not only use GPS to track the customer's car, but also its speed, and fine the driver \$150 for each speeding violation! The amount is automatically charged to the customer's bank card. Connecticut's Attorney

General called the practice "abusive and illegal," but the company insists the practice is legal. The matter goes to court Aug 22nd.

## FCC: Oops!

Guess what? A federal appeals court has ruled that the government should *not* have revoked the wireless licenses from NextWave Personal Communications when it went bankrupt and could not meet its payment deadlines. The licenses were sold for \$17 billion at a recent auction. Now it's up in the air whether Verizon Wireless (the top bidder) and other firms will get to keep the licenses.

*"Communications" is compiled by editor Rachel Baughn from news clippings mailed and emailed by our readers. Heartly thanks to this month's reporters: Anonymous, Albany, NY, and Mobile, AL; Ken Hydeman, Xenia, OH; Don Loving, Burneyville, OK; Sterling Marcher, La Mirada, CA; Doug Robertson, Oxnard, CA; Alan Stoddart, Brooklyn, NY; Robert Thomas, Bridgeport, CT; Jim Turner, Colorado Springs, CO; Gary Webbenhurst, WA; Richard Sklar, Seattle, WA. Via Email: Ralph Brandi, Kevin Carey, Roger Cravens, David George, Scott Heath, Alan Henney, Amer Khashoggi, Chuck Porter, Larry Van Horn, Dave White*

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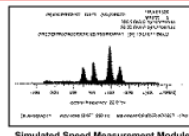
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# Listening In On The Middle East

by Dave White, K4CC

QSL cards courtesy of the SWL QSL Museum, [www.antique-corner.com/SWLQSL/](http://www.antique-corner.com/SWLQSL/)

**T**ime was, mention of the Middle East conjured up visions of magic carpets, genies in bottles, and camels bearing desert nomads. The real world Middle East of today, still evokes exotic images, but they tend toward terrorism, religious warfare, and oil reserves being manipulated for economic or political gain.

No matter what image the region conjures up for you, your shortwave receiver offers a window to what for many of us is one of the more mysterious parts of the world.

Ancient Persia has given way to militant Iran. Movies like *Lawrence of Arabia* have been replaced by blurry infrared pictures of anti-aircraft fire lighting up the night in Baghdad. Peaceful camel-riding nomads still exist, but so do vicious terrorists who use violent acts as political statements. As a result, most of us wouldn't want to live there, but we can listen to a seemingly never-ending series of major news events direct from the scene via shortwave radio.

In the Middle East, most governments very much want the world to know their own particular spin on events in their part of the globe, as well as in the world at large. As a result, many of them have invested heavily in high power shortwave transmitting facilities, with programming in several languages, including English. So, while some countries in the area have erratic or no shortwave broadcast facilities, the majority can be heard with a fair amount of regularity throughout the rest of the world.

## BAHRAIN

A typical weather forecast here is "fine, with rising sand in places during daytime." Bahrain was the first country in the region to discover oil, and also boasts one of the first shortwave radio stations in the Persian Gulf area, beginning in 1941.

Even though the Bahrain Radio Television Corporation website advertises a 24 hour English language service on 6010 kHz and 24 hour Arabic language service on 9746 kHz, neither of these stations has been heard in a very long time. These would be the most likely frequencies to monitor if the government's shortwave service is reactivated, but there are no indications of this happening any time soon.

## IRAN

Although it is not quite the hotbed of anti-American sentiment that it was a couple of decades ago when militant students captured the U.S. Embassy and held hundreds of Americans

hostage for over a year, the State Department continues to warn U.S. citizens not to travel to Iran. The country has yet to entirely resolve a variety of issues with neighboring Iraq, with which it was at war during most of the 1980s. It is also widely believed that Iran has been a party to some of the recent terrorism against American interests in the region.

The Voice of Islamic Republic of Iran (VOIRI) is a relatively easy catch with six hours of English daily via its 500 kW transmitters.

### VOIRI English Language Broadcasts

UTC	kHz
0030-0130	9022, 9835, 11970
1100-1230	15385, 15430, 15585, 21470, 21730
1530-1630	7245, 9635, 11775
1930-2030	9022, 9570, 11670, 13730
2130-2230	9570, 13745

## IRAQ

There are more shortwave broadcasts aimed at Iraq from outside its borders than there are originating inside them. Wars, economic sanctions, and the well-documented abuses of the regime of Saddam Hussein have left the government's Radio Iraq International with an irregular and largely unpredictable operating schedule. When it is operating, the station is

most often heard on 11787 kHz. Frequencies of 7175 and 9684 kHz are also authorized, with a published schedule of English broadcasts at 0130-0200 and 2000-2045 UTC.

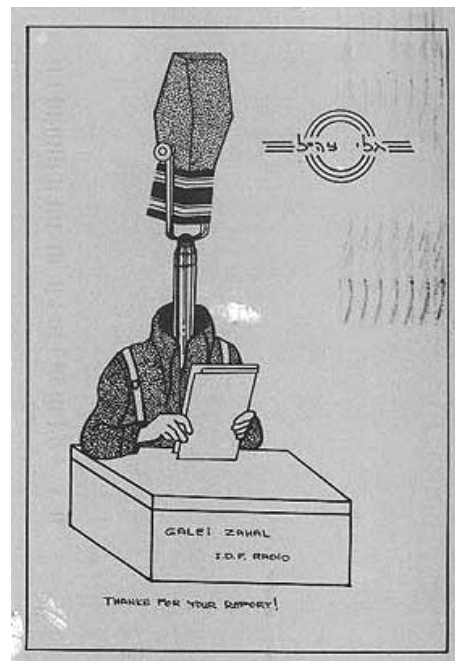
## ISRAEL

One of the few democracies in the region, Israel seems to be perpetually at war with one or more of its neighbors. Because of terrorist bombings in Israel and continuing violence in Gaza and the West Bank, the State Department has issued a travel warning strongly urging Americans to stay away. In fact, many areas of the country have been declared off-limits to U.S. Embassy personnel in Israel, for their own protection.

America's strongest ally in the region, Israel has one of the lighter menus of English language broadcasts on its international service. Israel Radio International (aka Kol Israel, the Voice of Israel) offers less than 90 minutes of English each day.

### Israel Radio International English Broadcasts

UTC	kHz
0400-0415	9435, 15640, 17545
1030-1035	15640, 17545
1600-1630	15615, 21670
1900-1930	11605, 15615, 15640, 1755

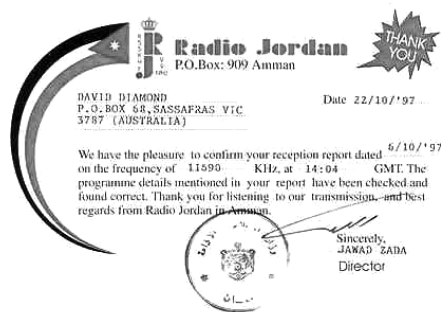




It's also possible to hear the Home Service, Reshet Bet, reported recently on 9345, 15760, and 17545 kHz. It is an "all news" station, in Hebrew. You can also occasionally catch signals of Galei Zahal (Israel Defense Forces Radio), listed on 6973 and 15785 kHz, also in Israel's native language.

## JORDAN

Jordan is one of most peaceful, modern countries in the region, even though its customs and laws are deeply rooted in the nation's state religion, Islam. Decidedly less militant than some of the other Islamic nations in the area, Jordan has a formal peace treaty with its neighbor Israel. This country's external shortwave service, Radio Jordan, has one of the most generous English language schedules, from 1000-1630 UTC on 11690 kHz, and from 1400-1630 UTC on 17680 kHz.



## KUWAIT

It has been more than a decade since Iraq invaded Kuwait, setting thousands of oil well fires and touching off America's involvement in Operation Desert Storm. Within four days, Kuwait had been liberated, and the U.S. went on the offensive against Saddam Hussein's ill-equipped troops.



For the most part, Kuwait has since returned to normal, although it is still an area where the U.S. government urges "a high level of security awareness" on the part of Americans in the region, due to the ongoing possibility of bombings, kidnappings, and other terrorist activities. Radio Kuwait maintains a schedule of English broadcasts on 11990 kHz at 1800-2100 UTC, and on 15110 kHz at 0500-0800 UTC.

## LEBANON

At about the same time that Iraq was in-

vading Kuwait in the early 1990s, Lebanon was ending 16 years of civil war that left much of the country's infrastructure in shambles. Things have improved, but even today Israeli, Syrian, and Hizballah troops occupy portions of Lebanon, including parts of the capital, Beirut.



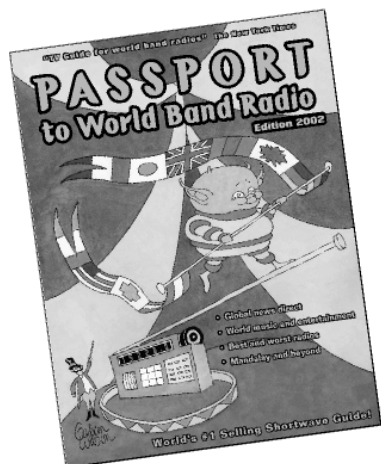
Shortwave broadcast signals from here have been virtually nonexistent since the High Adventure Ministries pulled up stakes and moved its Voice of Hope programming to leased transmitters in Germany last year. The government's Voice of Lebanon, which was only occasionally heard with its domestic shortwave service, now broadcasts only on AM, FM, and the Internet.

## OMAN

The Sultanate of Oman is about as modern and as peaceful as countries in the Middle East get. It has long maintained good relations with Britain, to the extent that the country's legal system is based partly on Islamic law and partly on English common law.

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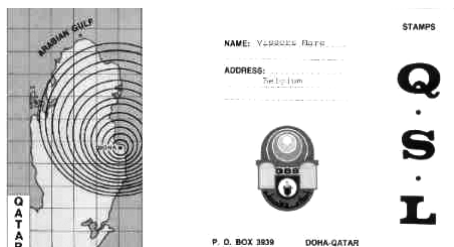


The BBC maintains relay transmitters in Oman to broadcast to the Middle East, India, Pakistan, and Afghanistan. The government's Sultanate of Oman Radio offers a couple of hours of English service each day, targeting Europe and Africa. They are heard frequently in North America on 15355 kHz at 0300-0400 UTC, and on 15410 kHz at 1400-1500 UTC.

## QATAR

The heat is fierce and the sandstorms frequent and violent on this little-known peninsula. Qatar is one of two countries in the region (Oman is the other) which began to thrive and prosper after a son ousted his own father as ruler of the country. The money made on its oil and natural gas reserves makes Qatar's per-capita income competitive with the leading industrial countries of Western Europe.

Throughout its history, Qatar has kept pretty much to itself, as evidenced by the fact



that all of the Qatar Broadcasting Service's shortwave broadcasts are in Arabic, relays of its home service broadcasts. Radio Qatar has recently been reported on 11820 and 17795 kHz, frequencies not registered with the High Frequency Co-ordination Conference (HFCC).

## Radio Qatar Arabic Language Broadcasts

UTC	kHz
0245-2130	9570
0245-0700	9695, 9700
0700-1300	11710, 11865
1300-1700	11655, 11660
1700-2130	7110, 9525

## SAUDI ARABIA

As you can readily see on a map, Saudi Arabia is a huge country. What you don't see on the map is that it is mostly desert and largely uninhabited. When Iraq attacked Kuwait, it was Saudi Arabia that gave shelter to Kuwait's royal family, and provided a staging area for United States ground forces.

In keeping with the country's physical size, the Broadcasting Service of the Kingdom of Saudi Arabia (BSKSA) has one of the most extensive

shortwave broadcast operations in the region. That's the good news. Unfortunately for North American listeners, none of BSKSA's broadcasts are in English, although its external service includes broadcasts in several Asian, African, and even Indonesian languages.

Most of its nearly three dozen operating frequencies are designated for home service and Islamic religious broadcasts.

## BSKSA External Service

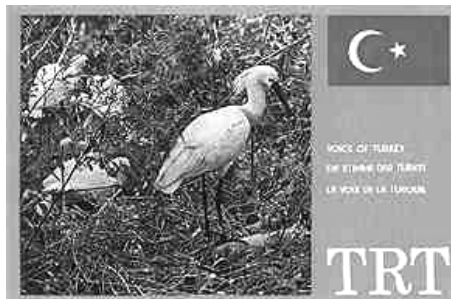
UTC	kHz
0400-0555	15275, 17760 (Turkish, Somali, Swahili)
1100-1155	21670 (Indonesian)
1200-1500	15345 (Urdu, Bengali)
1400-1555	11745 (Farsi)
1500-1655	9730 (Turkmen)
1700-1755	17775 (Bambara)

## SYRIA

Notwithstanding its anti-Iraq position during the Gulf War, Syria is one of the countries that the U.S. government believes is in the business of sponsoring terrorists. With its own troops ostensibly trying to help keep peace in Iraq, and Israeli troops occupying the Golan Heights on the Syrian border, this is one of the more interesting areas in the region. Radio Damascus maintains an external service that includes broadcasts in Spanish, French, German, Russian, and, happily, English, at 2000-2200 UTC on 12085 and 13610 kHz.

## TURKEY

Turkey occupies a unique geographic position, bordering Eastern Europe, Southwestern Asia, and the Mediterranean, Aegean, and Black Seas. Its southeastern neighbors, Iraq and Syria, are among the more volatile of the Middle East countries. Nonetheless, Turkey tries very hard to project the image of being a prime tourist destination. To help English speakers keep current on the news and culture of that part of the world, Voice of Turkey offers several time and frequency opportunities.



## Voice of Turkey English Language Service

UTC	kHz
0300-0400	7270, 11655, 21715
1230-1330	17810, 17830
1830-1930	9730 (USB), 9785
2030-2130	7170
2200-2300	7190, 11845

## UNITED ARAB EMIRATES

This is a modern, developed country – actually, a group of seven independent emirates, each with its own ruler but all under the auspices of a central, federal government. One of

the most highly touted tourist areas in the region, it has long been known for having shortwave broadcasts that are often in English, and easy to log.

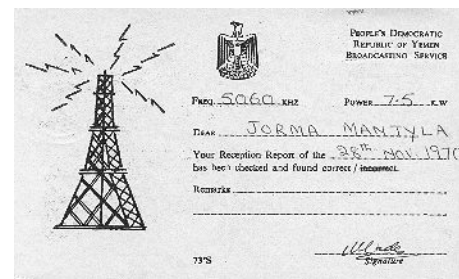
## Radio Dubai English Broadcasts

UTC	kHz
0330-0400	11725, 12005, 13675, 15395
0530-0600	13675, 15435, 17830, 21700
1030-1100	13675, 15370, 15395, 21605
1330-1400 and	
1600-1630	13630, 13675, 15395, 21605

It's also possible to hear UAE Radio from Abu Dhabi, the domestic service, in Arabic on 9695, 11940, 11945, 13755, 15215, 17760, and 21735 kHz.

## YEMEN

Stated simply, Yemen is not a nice place to be if you are American. In June, the State Department issued a strong Travel Warning, reminding U.S. citizens of the terrorist attack on a U.S. Navy vessels in port at Aden, Yemen, last October. More than 100 tourists have been kidnapped in Yemen in the past ten years. So, the best way to experience Yemen is at a great distance, via shortwave radio. Republic of Yemen Radio's English service operates from 0600-0700 UTC on 9780 kHz, and from 1800-1900 UTC on 9780 and 11770 kHz.



## IN CLOSING

In order to truly experience the flavor of Middle East life, don't restrict yourself just to English language broadcasts from the region. Seek out the mesmerizing Arabic music and chant-like language that you'll find on easily heard domestic broadcasts. Before long, you may even be able to replace today's headlines with mental images of peaceful nomads, magic carpets, and genies in bottles granting wishes. At the very least, you may see some of the mystery that surrounds this part of the world evaporate as you experience a different culture firsthand.

## About the Author

Dave White ([k4cc@k4cc.net](mailto:k4cc@k4cc.net)) lives in the best of all possible worlds – enjoying all aspects of communications as a hobby from an early age, and spending his working hours managing a company that produces radio and TV programs and networks. As an extra bonus, he gets to write occasional feature articles for *Monitoring Times*.





# QSLing the Middle East the War of Words Continues

By Gayle Van Horn

QSLs courtesy Gayle Van Horn collection



**W**ho's right and who's wrong? What is really going on in the Middle East and why? As tensions mount daily, the nations of the Middle East continue to persevere by enduring guerrilla war, suicide attacks, air strikes, and sieges.

For years the major attention of the Arab nations has been devoted to Israel. The Jewish state is the proclaimed enemy of most of these nations. Both sides live with anger, frustration, hope and fear. Having fought five wars in four decades, is Israel braced for another fight? Will the periodic cease-fire agreements last?

Who can forget August 2, 1990, when elements of the Iraqi army streamed across the borders of Kuwait and overthrew the legitimate government? Radio hobbyists were horrified to hear Radio Kuwait's pleas to their audience, "Dear listeners everywhere, do not be fooled by extraneous radio stations. Their news and bulletins are totally false. They are broadcasting venom through their propaganda. Do not pay attention to these broadcast. This is our radio station. This is Kuwait." Following several weeks of aerial bombardment, a U.S.-led coalition began a ground assault on February 23, 1991, completely liberating Kuwait in four days.

What does the future hold for Iraq? Trade sanctions remain in effect, and so do the political tirades from strongman Saddam Hussein, while he continues to dispute land territory with Iran – a hold-over from their indecisive 1980-1888 war.

For many shortwave listeners, the Middle East is a world of mystery and intrigue. The wave of opinions and propaganda continue to unfold on shortwave broadcast stations. QSLing the Middle East can be as intriguing and confusing as the daily rhetoric.

During the holy month of Ramadan (a period of prayers and daily fasting from sunrise to sunset), many of the stations extend their broadcast hours, some to 24 hours. This practice of the Islamic community provides an excellent opportunity to log and verify stations. Ramadan, the ninth month of the Muslim calendar, will be November 16.

Middle Eastern news to complement your

listening and suggest a country on which to focus may be accessed through the pages of the Internet. *The Middle East Daily* is an excellent site that includes an extensive list of links at <http://www.middleeastdaily.com>. *The Middle East Internet Pages* <http://www.middle-east-pages.com> has country links or topics of interest, while the *Middle East Gateway* is found at <http://www.albawaba.com>.

Various radio-related websites are equally advantageous as a starting point. Considering that most of the Middle Eastern stations have limited English services, it would be beneficial to follow frequency and station information through consulting the *Monitoring Times-Global Forum* column, *Ontario DX* <http://www.odxa.on.ca/>, *Cumbre DX* <http://www.cumbredx.org>, *North American Shortwave Association (NASWA)* <http://www.naswa.org>, *DX Listening Digest* <http://www.angelfire.com/ok/worldofradio>, *Passport to World Band Radio*, and *World Radio TV Handbook* publications. For current monthly QSLing trends, consult *QSL Report*.

When reporting, most of the stations will accept English reception reports with IRCs. You may recall that I do not usually endorse the use of currency and prefer to enclose mint postage stamps, if available, for the country to which I am reporting. (One source fore these is Bill Plum's *Airmail Postage & DX Supplies*, 12 Glenn Rd., Flemington, NJ 08822-3322.) As a preference, I always enclose a self-addressed-envelope using a printed address label attached for the station's reply, as well as souvenir postcards. DXers report success with enclosing cassette program recordings of Arabic or indigenous services, and prepared QSL cards the station can complete and return.

This month we delve into the fascinating and volatile world of the Middle East with a focus on QSL trends, as indicated from hobbyists, newsletters and online services. Physical station addresses are included at the conclusion. Political uncertainty will assuredly prevail in the Middle East – as will the War of the Words.

## Afghanistan

Considered *near* Middle East, Afghanistan

lies north and west of Pakistan, just east of Iran. Radio Voice of Shari'ah ("Voice of Islamic Law"), active since 1995, is the official Taleban-run broadcaster formerly Radio Afghanistan. Their broadcasting schedule remains irregular, but they have recently been heard in English at \*0200-0220 on 7088; Multilingual broadcast have been monitored at \*1500-1530 on 7075, 7085 kHz; 1700-1730 on 4782 kHz; 2100-2130 on 7082 kHz. The station may also use 7022 or 7087 kHz up to 1545 UTC.

Operated by the de facto regime in Kabul, the station is considered by many as a clandestine, since the Taliban have yet to be recognized by the international community as holding legitimate governance; while others note it as both a domestic and an external broadcaster. According to *Clandestine Radio Watch (CRW)*, <http://www.clandestineradio.com>, the station is challenging to hear and only time will tell how long they will last before Afghanistan finds itself under the grapple of another group competing for power.

It is unknown if this station has verified any reception reports. Considering the intermittent Afghan postal service which operates via Pakistan, reports may require persistent follow ups over an extended period of time. English reports are occasionally verified; however, languages of Arabic, Russian, Urdu, Pashto, Farsi and Dari are preferred. For more information on translating languages of the Middle East, consult <http://www.languageforce.com> or your local office supply store for translation software.

Takhar Radio, based in Pakistan, is another clandestine broadcasting in support of the anti-Taleban Northern Alliance, led by Ahmad Shah Masud and Borhanoddin Rabbani. Takhar Radio was controlled by the Taleban forces from August 9 until October 17, 1998, when it identified itself as Radio Voice of Shari'ah of Takhar Province. Prior to August 9, it broadcast in support of Borhanoddin Rabbani, the former president of Afghanistan, who was ousted from Kabul by Taleban forces in late September 1996. Previous monitoring has revealed Takhar Radio at 1400-1430 on 7070 kHz, alt. 7085 kHz.

There is no established QSLing policy, but reportedly reception reports are welcome in

English, Arabic, Farsi or Dari, to the attention of Mr. Shamsul Haq Arayanfar-Cultural Attache, at the embassy in Dushanbe. North American listeners may favor sending their letters to the Afghan Mission to the United Nations. <http://www.afghangovernment.org> Email: [afghangovernment@afghangovernment.org](mailto:afghangovernment@afghangovernment.org)

## Armenia

An Orthodox Christian country, Armenian leaders remain preoccupied by the long conflict with Azerbaijan over Nagorno-Karabakh, a primarily Armenian-populated exclave, assigned to Soviet Azerbaijan in the 1920s by Moscow. Armenia and Azerbaijan began fighting over the exclave in 1988, the struggle escalated after both countries attained independence from the Soviet Union in 1991. By May 1994, when a cease-fire took hold, Armenian forces held not only Nagorno-Karabakh but also a significant portion of Azerbaijan proper. The economies of both sides have been hurt by their inability to make substantial progress toward a peaceful resolution.

DXers have two opportunities to log and verify Armenia. Trans World Radio, an international broadcasting ministry, broadcasts daily in English to the Middle East from the Kamo, Armenia, transmitter site; 1625-1640 on 5855, alt. 6145 kHz. TWR is an excellent verifier and responds with colorful cards, stickers and brochures. A polite request within your letter for notation of their Armenian site will assist your country total, as TWR uses several world transmitter sites. To learn more on the TWR ministry visit <http://twr.org>.

Voice of Armenia is the external service of Armenian Radio. English programming may also be identified as, "Armenian National Radio." Their English service, beamed to Europe, is broadcast on Sunday 0810-0830 on 4810, 15270 kHz; Monday-Saturday 1940-2000 on 4810 and 9960 kHz. The station does not have a website. Replies tend to be irregular and may include station souvenirs. Armenian stamps or currency are recommended. For additional Armenian news, the *Noyan Tapan* ("Noah's Ark") *Information* website <http://www.noyan-tapan.com>, contains an English link to national projects and *Today's Top News*.

## Azerbaijan

Azerbaijan – a nation of Turkic Muslims – has been an independent republic since the collapse of the Soviet Union in 1991. Despite a cease-fire, in place since 1994, Azerbaijan has

yet to resolve its conflict with Armenia over the Azerbaijani Nagorno-Karabakh enclave (largely Armenian populated). Azerbaijan has lost almost 20% of its territory and must support some 750,000 refugees as a result of the conflict. Corruption is ubiquitous and the promise of wealth from Azerbaijan's undeveloped petroleum resources remains largely unfulfilled.

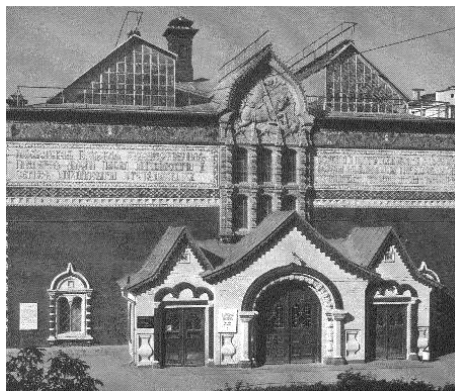
Shortwave is represented by the English service announced as, "Radio Dada Gorgud, the Voice of Azerbaijan." Dada Gorgud is the name of a famous epic hero in Azerbaijani history. Daily English has been monitored from 1700-1730 on 6110 and 9155 kHz. The station replies in English intermittently with cards, books or souvenirs, currency or mint postage helpful.

## Cyprus

Cyprus Broadcasting Corporation (CyBC) is the broadcasting authority of the Greek Cypriot government. This service is for Cypriots in the United Kingdom, transmitting via Merlin Communications facilities near Limassol, Cyprus. CyBC broadcast in Greek on Friday, Saturday and Sunday and can be heard from \*2215-2245\* on 6180, 7205 and 9760 kHz. CyBC was inaugurated May 1, 1977, and verifies readily. Mint stamps or IRCs are accepted. <http://www.cybc.com.cy>, Email: [rik@xybc.com.cy](mailto:rik@xybc.com.cy)

## Georgia

Subsequent to the dissolution of the Soviet Union in 1991, oil-rich Georgia faced an imminent strife with a breakaway region called Abkhazia. Today Russian troops remain garrisoned at four military bases, and as peacekeepers in the separatist regions of Abkhazia and South Ossetia. Broadcasting from Dusheti, Georgia, as part of the Abkhazian Relations Institute, is Radio Khara ("Our Radio"), a clandestine station, whose goal is to promote reconciliation be-



tween Georgians and Abkhazians.

Radio Khara, as reported in *DX Listening Digest* and *CRW*, has been broadcasting since April 1999 on 4875 kHz at \*1705-1450\* Monday and Thursday and \*0505-0540\* Tuesday and Friday, presumably in the Abkhaz language. The station consciously avoids the Georgia-Abkhazian conflict and opts for programming of international news topics, cultural, sports, modern music, *Literary Page*, *Hollywood Gossip* and more. Email from the manager Nino Berdznishvili, may be directed to [league@geoconst.org.ge](mailto:league@geoconst.org.ge). As indicated by a re-

cent *DX Stamp Service* price list, Georgian stamps are not available, nor would I recommend IRCs.

Broadcasting from the capital city Tbilisi is the external service of Georgian Radio, identifying itself in Russian as "Radiostantsiya Grunsiya." English programming is available as noted in *MT's* September *Shortwave Guide*, at 0530-0600 on 11805 kHz to Europe. Verifications are infrequent and slow, sometimes taking a year or more to reply. Currency is appreciated due to the station's financial plight.

## Iran

The people of Iran currently appear to be caught between the reformists who support President Khatami and hardliners who follow Iranian Supreme Leader Ayatollah Khamenei, thus resulting in increased clandestine activity. Recent monitoring has observed Radio Barabari ("Radio Equality") on 7480 in Persian 1700-1730. The station's website <http://www.barabari.net/> states the aim of the station is "a platform for breaking walls of censorship and oppression." Persian programming is available online 24 hours. No current address is known; however, email reports may be attempted to [info@barabari.org](mailto:info@barabari.org). Voice of Iranian Kordestan, operated by the Democratic Party of Iranian Kurdistan, has also been observed on 3985 alt. 3940, 4200 kHz) in Kurdish and Persian (0200-0300; 0330-0400; 1400-1530; 1530-1600) Frequencies may vary to avoid signal jamming. Website: <http://www.pdk-iran.org>.

Voice of the Islamic Republic of Iran (VIRI) is the external service of the Voice and Vision of the Islamic Republic of Iran (VIRI), which is also known as Islamic Republic of Iran Broadcasting (IRIM). <http://www.irib.com/> Live Audio is available in Arabic at; <http://www.irib.com/live/>. Verifications are fair, usually resulting in a card, schedules, brochures or an Iranian newspaper.

## Iraq

Broadcasting by Radio Iraq International has been highly erratic for several years. The current broadcasts are greatly reduced from those observed at various times over previous years, when the station was sometimes heard for most





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AR8600	SCN 8	\$899.95

## YAESU

VR-500	SCN 6	\$324.95
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## ICOM

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AOR MA500 Wide Range	ANT 12	\$99.00
AOR SA7000 super-wide receiving	ANT 39	\$199.95

## ACCESSORIES

### UNIDEN BC SCANNERS

Computer interface cable for BC895	ACC 15	\$29.95
Scanner Master Reaction Tuner	ACC 22	\$69.95
BP-180 Uniden battery pack	BAT 5	\$19.95
BP120 spare battery & charger	BAT 24	\$25.95
BC235/245 hard leather case	CAS 3	\$29.95
DC cord	DCC 7	\$15.95

### ALINCO SCANNERS

EBP-34N Longlife NiCd battery	BAT 21	\$79.95
EBP-37N Standard battery	BAT 21A	\$39.95
EDH-16 battery case, 4 "AA"	BAT 22	\$9.95
DJ-X10T soft case	CAS 19	\$12.95
EDC-36 car lighter cable w/filter	DCC 14	\$23.95

### AOR SCANNERS

Extended memory card for AR8200II	ACC 27	\$79.00
AR8200II leather case	CAS 21	\$24.95
AR8200II soft case	CAS 25	\$12.95
Tape recording lead for AR8200II	CBL 7	\$61.00
Computer control lead for AR8200II	CBL 8	\$109.00
AC adaptor for AR8200II	PWR 24	\$21.95

### YAESU SCANNERS

VR-500 cloning software and cable	SFT 25	\$39.95
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### ICOM SCANNERS

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R2 soft case	CAS 20	\$29.95
R3 leather case	CAS 2	\$19.95
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of the day with multilingual programming. English services, as indicated in the *Shortwave Guide*, begin at 0200 UTC. Certain broadcasts are available on satellite services as well as the Internet. Television is available in Arabic and intermittent English news with live digital streaming at <http://www.iraqtv.ws/>.

Mother of All Battles Radio was first heard in January 1991 during the Gulf War, which the Iraqi's referred to as the "mother of all battles." Broadcasts were suspended after the transmitters were destroyed by the allied forces, but it resumed broadcasting August 2, 1995. Broadcasts have been heard on a sporadic basis on 11785, \*1600-1850; 9755, 1700-2000 UTC.

Voice of Iraqi Kurdistan (Kurdish: "era dangi kurdistanira iraqiya"; Arabic: "sawt kurdistan al-iraq, sawt al-hizb al-dimuqrati al-kurdistani al-iraqi") broadcasts in support of the Kurdistan Democratic party (KDP) led by Mas'ud Barzani, from Salah al-Din in Iraqi Kurdistan. Station authorities indicate the radio station was established in September 1963, with a European service introduced April 27, 1995. Transmitters are reportedly located in the Kurdish section of Iraq. The station has been observed on 4085 and 5850 at 1802 and 1930 UTC. <http://www.kdp.pp.se/> Email: [kdppress@aol.com](mailto:kdppress@aol.com).

Iraqi clandestine, Radio Bopeshawa (translated as "Radio Forward"), broadcast in support of the Worker-Communist Party of Iraq from Arbil in Iraqi Kurdistan. Bopeshaw is also the name of the party's newspaper. The station was first observed May 20, 1996, broadcasting as Voice of the Worker-Communist Party. The station was renamed Radio Bopeshawa and moved from Al-Sulaymaniyah to Arbil to resume broadcasting February 1, 2001. Programming is Monday, Wednesday and Fridays at 1500-1600 on 9960 kHz. The first half of the program is in Arabic, the second in Kurdish, opening with Lambada music.

The Voice of the People of Kurdistan is the official radio station of the Patriotic Union of Kurdistan (PUK) led by Jalal Talabani. It broadcasts from Al-Sulaymaniyah in Iraqi Kurdistan. According to the station website <http://www.puk.org>, the station was established in 1979 under the name "Voice of the Iraqi Revolution" and adopted the current name in 1983. Multilingual programming is audible daily on 4060, 6995 kHz; 0300-0700 and 1345-2100 UTC.

The station replies to correspondence in English and German and verifies reception reports. Email: [pukg@cs.com](mailto:pukg@cs.com).

Radio Free Europe/Radio Liberty, a United States government-funded service overseas, broadcasts the clandestine station, Radio Free Iraq. Arabic broadcast are transmitted from Kavala, Greece; Lampertheim, Germany; and Woofferton, United Kingdom. Frequency schedules may be obtained from the aforementioned sources. Full data verifications on RFE/RL letterhead should be addressed to David Walcutt [walcutt@rferl.org](mailto:walcutt@rferl.org), or the Washington, DC address in our directory. Return postage is not required.

## Israel

Kol Israel is a Hebrew translation for The Voice of Israel, <http://www.israelradio.org>. Many broadcasts are relays of Israel Radio domestic

networks, in particular Network A- Reshet Alef (English), Network B- Reshet Bet (Hebrew), Network D- Reshet Delet (Arabic) <http://dalet.iba.org.il/> and the REQA network for immigrants. All other programs are produced for the Reshet Hei overseas service. Some Kol Israel programs are available via World Radio Network <http://wrn.org>, while others are relayed via international radio stations and U.S. affiliates. Kol Israel verifies rather slowly with full or partial date cards, and may enclose brochures. Please include at least one IRC, as requested by the station.

Israel's Defense Forces Radio (Galei Zahal) airs programming beamed to outside Israel, usually on out-of-band channels from unknown transmitter locations. Recent observations have noted them on 6973 kHz, 0210-0259\*, and 0320-0440 UTC on 15788 kHz. Their English/Hebrew website <http://www.idf.il/> expounds their mission as, "to defend the existence and territorial integrity of the state of Israel." IRCs are recommended for verifications.

## Jordan

The English service of Radio Jordan <http://www.jrtv.co> remains a slow and irregular verifier. Stickers, pennants and colorful cards are plentiful and worth the patience for the persistent hobbyist. Enclosing currency is appreciated. The English service (1300-1630 on 11690 kHz) is in part a relay rebroadcast from FM and mediumwave programming. Radio Jordan is also available via satellite from Eutelsat at 13E, 12654 MHz horizontal in MPEG-2 digital format.

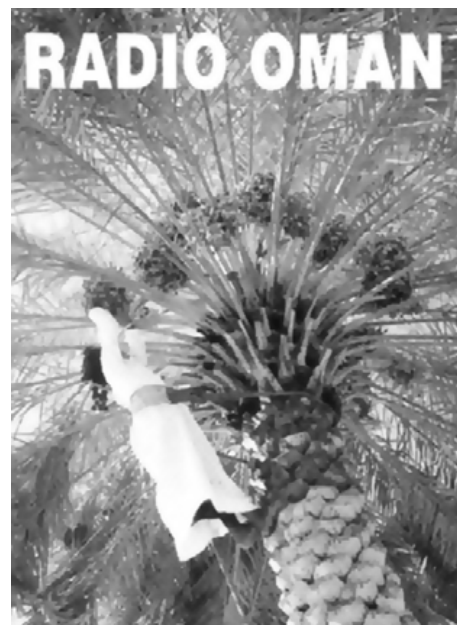
## Kuwait

Since their liberation, Kuwait has remained friendly to listeners and DXers, especially those from ally nations. Radio Kuwait continues to verify regularly and occasionally encloses station stickers and souvenirs. IRCs are appreciated but not required. Every night from 8:00-11:00 pm (local Kuwait) listeners in North America and Europe can tune into Kuwait's Easy FM 92.5 relay on 11900 kHz from 1800-2100 UTC. Additional English broadcast hours are included in the *Shortwave Guide* beginning at 0500 UTC. Radio Kuwait's website, <http://www.moinfo.gov.kw/> contains informative links, including one to the Ministry of Information, with a listing of radio and television stations available on video or Real Audio. Newscasts are available at <http://www.radiokuwait.org>.

## Sultanate of Oman

One of my favorite QSLs is from Radio Oman. The oversized, colorful card arrived within a few weeks for an English report for their Arabic broadcast. IRCs or mint stamps appear to be the preferred choice. Radio and television information may be found at <http://www.oman-tv.gov.om/> English programming is now active daily 0300-0400 UTC, 15355 and 1400-1500 UTC on 15140 kHz.

Oman has preserved a long-standing political and military relationship with Britain, as evidenced by retaining the BBC World Service-Eastern Relay station, located in Masirah, with construction underway on a new site at Al-Ashikhara. Nontechnical reports may be sent to the London



address; however, do not expect an informative or full data verification. You may have better luck sending your letter of technical details to the Senior Transmitter Engineer in Oman.

## Qatar

Qatar Broadcasting Service (QBS), from the capital city of Doha, was officially inaugurated June 25, 1968, with two daily five-hour transmissions, using one 10 kW transmitter. Today, QBS broadcasts over 20 hours daily via 12 powerful transmitters distributed among three transmitting studios in Al-Khiseh, Al-Arish and Al-Markhieh.

During Ramadan, Qatar's main Arabic service is on the air 24 hours, resulting in an excellent opportunity to log and verify QBS. Considered by many as an excellent catch, QBS broadcasts on shortwave in Arabic and Urdu, although English identifications are used. Full data QSL cards are supplied with program schedules and station brochures. Replies tend to be erratic from a few months to several years, requiring follow-ups. Addressing your letter to the Head of the Public Relations Department may improve your response time. IRCs or mint postage stamps are accepted.

## Saudi Arabia

BSKSA (Broadcasting Service of the Kingdom of Saudi Arabia) represents an extensive broadcasting schedule of domestic and external services, expanded for Ramadan. English is provided only via satellite on Arabsat 2A at 26 E on 3.925 MHz, RHCP, audio subcarrier 7.8 MHz. BSKSA will verify an English letter; however, their reply tends to be irregular and may require follow-up reports. Cassette tape recordings of programming may improve your reply with enclosed mint postage. No current websites are available. Address your letter to the Director of Frequency Management.

## Syrian Arab Republic

With talks resuming with Israel over the return of the Golan Heights, Syria remains a country to watch and monitor. Tune in each after-



noon 2000-2200 UTC on 12085 or 13610 kHz, and chances are you may log Radio Damascus beaming their programming in English to Europe. No website is available. In recent months, QSLing has improved, but tends to be intermittent at best. Station souvenirs have been received including color pennants, stickers and national flags. Currency and IRCs have proven successful. Address your letters to Director General of Broadcasting and TV.

## Turkey

The Voice of Turkey's station slogan is Sunshine Radio, and true to their slogan, they are as dependable as the sun for QSLing. The Voice of Turkey remains one of the best and most prolific verifiers. VOT broadcasts 27 foreign languages beamed to Europe, Asia, Africa, Southeast Asia, Australia and North America, via seven 500 kW transmitters on shortwave, as well as in analog and digital formats through TURKSAT 1CC, THAICOM-3 and OPUS B3 satellites. Without question, the Voice of Turkey provides its listeners an outstanding response rate to reception reports, enclosing pennants, stickers, program schedules and colorful oversized cards featuring Turkish souvenirs, landmarks, crafts, treasures, as well as tourist literature. The Voice of Turkey is available via the Internet at <http://www.tsr.gov.tr>. Tourism Radio and a Turkish site are located at <http://www.trt.net.tr> including Real Audio. Return postage is appreciated, but not required.

## United Arab Emirates

Considering the success and extensive programming of Radio Dubai via radio and satellite services, it is surprising that they do not currently have an Internet presence. Arabia FM <http://www.arabiafm.com/>, however, contains links to Dubai 94 MHz Arabic FM, as well as an extensive listing of available Middle Eastern stations via Real Audio FM and television. UAE Radio Dubai is generally easy to hear daily in English and Arabic, and verifies irregularly with color map cards and station pennants.

Equally baffling is the lack of an Internet website for UAE Radio Abu Dhabi. By far, Abu Dhabi, both the capital of the emirate and the federal capital, is the richest and largest of the seven emirates, and it broadcasts daily in Arabic on multiple frequencies. The station is operated by the UAE Ministry of Information and Culture and verifies irregularly with full data colored folder cards and station souvenirs. Currency is not recommended by the station and mint stamps or IRCs are favored by DXers. For country collectors, Abu Dhabi counts as a separate country as indicated by the NASWA (North American Shortwave Association) Awards Program.

## Yemen

Following two decades of hostilities between the north and southern governments, the two countries of Yemen were formally unified as the Republic of Yemen in 1990. Republic of Yemen Radio broadcasts daily in English on 9780 to the Middle East at 0600-0700 and 1800-1900 UTC. The station does not have a website. Full data cards are slow and may require a follow-up.

## Middle East Address Directory

### Afghanistan

Radio Voice of Shari'ah  
Afghan Radio  
P.O. Box 544  
Ansari Watt  
Kabul, Afghanistan via Pakistan

Takhar Radio  
Embassy of Afghanistan  
ul. Pushkina  
Dushanbe, Tajikistan

Mission of Afghanistan to the United Nations  
360 Lexington Avenue-11th Floor  
New York, NY 10010 USA

### Armenia

Trans World Radio relay  
International Headquarters  
P.O. Box 8700  
Cary, NC 27512-8700 USA

Voice of Armenia  
Alex Manoukian Street 5  
Yerevan 375025, Republic of Armenia

### Azerbaijan

Radio Dada Gorgud/Voice of Azerbaijan  
Mekhti Husein Street 1  
Baku 370011, Azerbaijan

### Bahrain

(inactive on SW)

### Cyprus

CyBC Broadcasting House  
P.O. Box 4824  
1397 Nicosia, Cyprus

### Georgia

Georgian Radio/Radio Tbilisi  
M. Kostava Street 68  
Tbilisi 380071  
Republic of Georgia

Radio Abkhazia  
Director: Aurab Argun  
National Library of Abkhazia  
Krasnodar District  
P.O. Box 964  
354000 Sochi, Russia

Radio Khara  
Rustaveli Ave. 52  
II Floor-Apt. 211-212  
Tbilisi, Georgia

### Iran

Voice of the Islamic Rep. Of Iran  
P.O. Box 19395-6767  
Tehran, Iran

### Iraq

Radio Iraq International  
P.O. Box 8145  
Baghdad 12222, Iraq

Clandestine: Voice of Iranian Kordestan PDKI  
Boite Postal 102  
F-75623 Paris Cedex 13, France

Clandestine: Voice of Iraqi Kurdistan  
KDP International Relations Committee  
P.O. Box 7725  
London SW1V 3ZD  
United Kingdom

(or) Voice of Iraqi Kurdistan  
KDP  
2025 I Street N.W. # 1108  
Washington, DC 20006 USA

Clandestine: Radio Bopeshawa  
P.O. Box 7962  
London SE1 2ZG United Kingdom

### Israel

Galei-Zahal  
Military Post Office 1005  
Zahal, Israel

Kol Israel  
Israel Broadcasting Authority  
P.O. Box 1082  
Jerusalem 91010, Israel

### Jordan

P.O. Box 909  
Amman, Jordan

### Kuwait

Engineering Communications Dept.  
Controller of Frequency Management  
P.O. Box 397  
Safat 13004, Kuwait

### Lebanon

(inactive on shortwave)

Sultanate of Oman  
Radio Oman  
Ministry of Information  
P.O. Box 113  
Muscat, Sultanate of Oman

### BBC World Service-Eastern Relay Station

Senior Transmitter Engineer  
P.O. Box 23  
Wilayat Masirah  
Postal Code 414  
Sultanate of Oman

(non-technical)  
BBC World Service  
Bush House  
Strand, London  
WC2B 4PH United Kingdom

### Qatar

Qatar Broadcasting Service  
P.O. Box 3939  
Doha, Qatar

### Saudi Arabia

P.O. Box 61718  
Riyadh 11575  
Kingdom of Saudi Arabia

### Syrian Arab Republic

Omyyad Square  
Damascus, Syria

### Turkey

Voice of Turkey  
P.O. Box 333  
Yenisehir 06443  
Ankara, Turkey

Turkiye Polis Radyosu  
(Turkish Police Radio)  
T.C. Icisleriakanligi  
Emniyet Genel Mudurlugu  
Ankara, Turkey

### United Arab Emirates

UAE Radio from Abu Dhabi  
Ministry of Information & Culture  
P.O. Box 63  
Abu Dhabi, United Arab Emirates

Radio Dubai  
UAE Radio & TV Dubai  
P.O. Box 1695  
Dubai, United Arab Emirates

### Yemen (Republic of)

Republic of Yemen Radio  
Ministry of Information  
P.O. Box 2182  
(or) P.O. Box 2371  
Sana'a, Republic of Yemen

(or) Technical Department  
P.O. Box 2371  
Sana'a, Republic of Yemen

# Fix It. Don't Toss It

By Arthur R. Lee

**M**ost of us, at one time or another, have thrown away something useful because it didn't work. Perhaps we didn't have the time or patience to get it back into working order. Yet, many household items can be restored to full use with only a few minutes of your time - and at no cost! And we don't have to be a rocket scientist to do it.

Several years ago, as we were about to move to Guam from New Jersey, we held a garage sale. All of our unused winter toys would be useless at our next duty station

in the tropics so were placed on the table at a very reduced cost. My daughter had a small AM/FM radio that was her pride and joy, but it didn't work. I took it to a repair shop but the technician said that his labor charge would far exceed the value of the radio. I took it apart but couldn't find the problem. The radio was of high quality, relatively high cost and practically new. However, we stuck a tag on it, "For sale, \$1.00. But does not work!"

We sold nearly everything that we did not wish to ship in our household goods,

including the little radio. With the remainder of our sale goods, we reopened our garage sale the next day. The woman who purchased our daughter's radio returned. Her face was beaming when she asked, "Do you have any more radios to sell?" "No," my wife answered, "why do you ask?"

"Well," the woman replied, "my husband took the back off the radio you sold us and found a tiny wire disconnected from the antenna. When he reconnected it, the radio worked fine!"

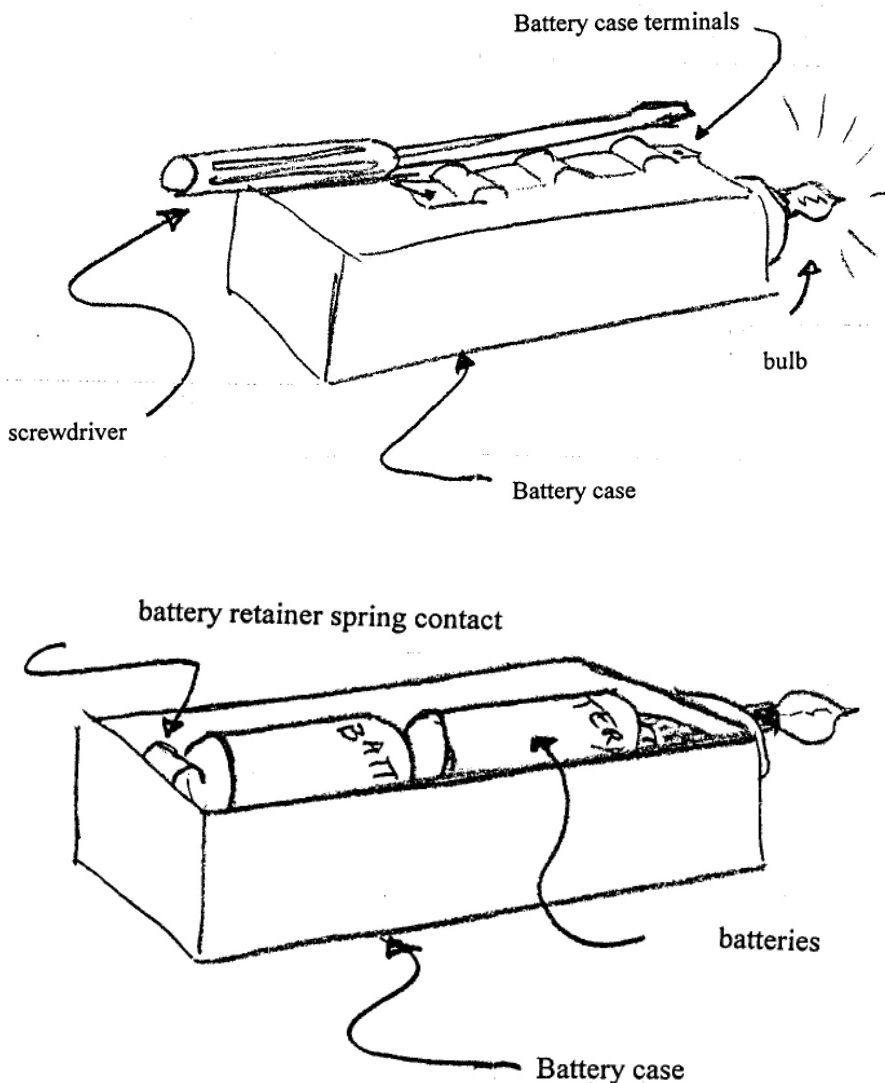
Recently, my wife and daughter brought home some children's toys from a fruitful day of attending garage and yard sales. One delightful toy, a beautiful and highly colorful small flashlight, wouldn't work. The batteries were probably dead. New, the light probably sold for ten dollars or more. A twist of a knob on the side of the light would change filters from red, green or white. It was an ideal toy for the curious mind and fingers of our 19 month old grandson.

My wife disassembled the flashlight, and removed the dead batteries. The batteries were discarded, but due to their age, had lightly corroded the case contacts. The contacts were easily wiped and scraped clean. New batteries were installed but the light still did not work. Maybe a bad bulb was also the reason for the light not working. The bulb appeared to be in good condition, but the fine filament could be separated and not visibly seen. Not having a new bulb, further investigation was in order.

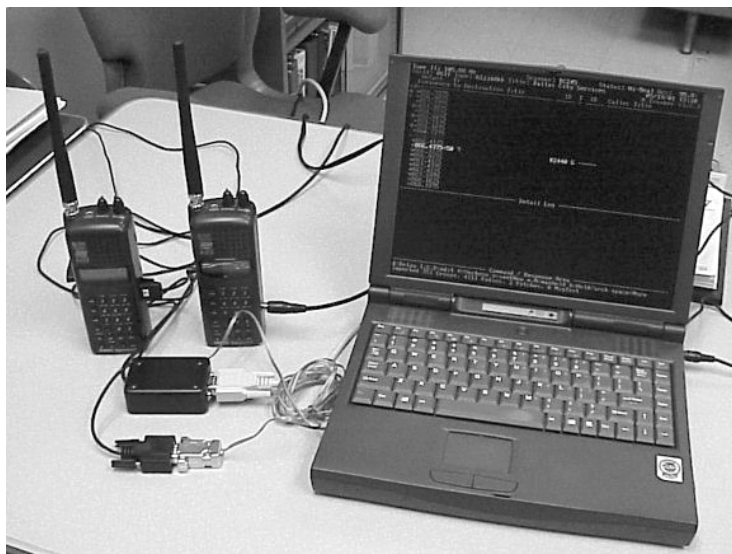
With a small screwdriver, I shorted across the battery case terminals. (Fig. 1) The bulb glowed merrily and brightly! Still, when reassembled, the flashlight would not work. Why?

The little spring contacts on the battery case were the next items to check. (Fig. 2) Yes, they had been compressed too far in to make contact with the metal connectors of the switch. A careful bending, outward, of the spring contacts was made. The battery case was reinserted into the flashlight. Presto! It worked!

For the small cost of a quarter, a nice toy was purchased. After a few minutes of inspection, cleaning and adjustment, it works just like new. It will provide many hours of fun and enjoyment for the happy recipient.







# Following Trunked Radio Systems by Computer

By Mark Colborn, KD5ELF

The Dallas/Fort Worth, Texas, area has probably the largest concentration of trunked radio systems in the country, and the list keeps growing yearly. Many listeners monitor these systems and publish the information on numerous web sites which are updated often.

Monitors in other areas of the country, however, may not be so lucky. Especially with new systems, information can be hard to come by. This makes the process of programming a TrunkTracker scanner difficult at best. So, how can you obtain information on these unreported and elusive systems?

The freeware programs Trunker, Etrunker and TREPORT are your answer. Installed in 'most any computer, these programs provide a wealth of information on trunked systems immediately with the help of a discriminator-tapped scanner and an easy-to-build, Ham-com, 2-Level FSK decoder device.

With the aid of Trunker and Etrunker, for instance, you can set priorities for monitoring, assign different colors to individual groups, like blue for Police, red for Fire, and yellow for EMS. And, at the same time, the programs log a wealth of information to text files including system identification and frequency information, talk group associations and number of hits, radio identifications and associations, and time and date of last hit. Information can be changed on screen while the programs are running, or changes can be made all at once to the various text files. Also, a second scanner can be linked to the system so activity that is appearing on the computer screen can be monitored.

Now, are you thinking that you are not technically inclined enough to do the discriminator tap to your scanner or build the decoder box? Well, I used to think that also, but believe me it is really quite easy, and I have no formal electronics training at all. Granted, it took me almost a year to do all the research and figure it all out, but it made for a really cool project.

As an aside, I must say that without the help of Bill Cheek, this project would never have been possible. Bill unfortunately passed away with cancer in July of 2000. Bill authored and edited (with the help of his wife, Cindy) the

*World Scanner Report (WSR)*. WSR was a very informative, down-to-basics, hard-hitting newsletter on the subject of computer aided scanning and other radio subjects. His monthly column in *Monitoring Times* as well as WSR have been sorely missed since his passing.

Before long, you can be following trunked systems on your computer screen also. You can do this project easily if you round up the right equipment. Visit an electronic supplies store and purchase a high quality soldering iron – for instance, a Weller with a sharp 600-degree tip – some high quality solder, a good solder sucker, and some really good wire strippers.

## The Scanner Connection

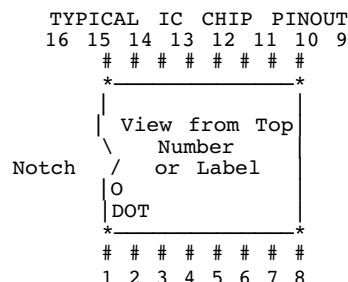
The first step to following trunked radio systems with a computer is to do a discriminator tap modification to your scanner. This is necessary because the audio plug output on your scanner doesn't provide the signal bandwidth necessary for decoding. The signal has to be taken directly from the baseband audio IC chip inside the receiver. For chip locations within your particular scanner, go to Bill Cheek's SCANDATA.FAQ, Table 1 for pin locations (available on Lindsay Blanton's Digital Signals web page at: <http://www.trunkedradio.net/digital.htm>

Most of the major scanners are listed there (and the file is consistently updated by Lindsay). If not, go to Table 2 and many of the popular chips are listed with the correct pin locations for the base band audio.

The next step is to open up your scanner and try to locate the correct IC chip. The chip should have a number or label on the top that corresponds to one on Cheek's list. Use the figure below to locate the correct pin. Most ICs have 8, 14, 16, or 18 pins. Look for a (painted or embedded), notch, or nook at one end of the chip. This shows the end of the chip that starts with Pin #1 and goes counterclockwise around the chip to the highest number on the opposite side.

Sometimes, it's not easy to figure out which chip is the correct one. The Bearcat 235XLT pictured in this article had a chip that was marked with a strange number, calling for a process of elimination. Also, it had a very faintly painted bar on the left side. A similarly designed BC

230XLT, however, was numbered correctly (same number as listed for the 235XLT) and had a dot and notch on the left side for easy identification.

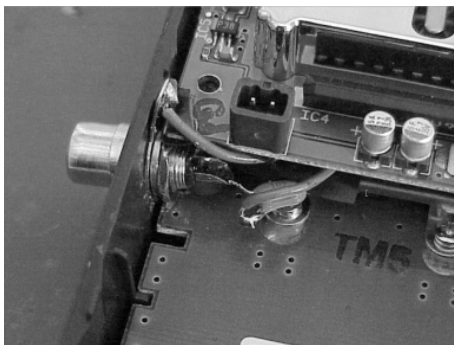


Install an RCA Shielded Phono Female Jack (RS Cat # 274-346) on the outside of the case of your scanner, typically the rear panel. For base scanners this is relatively easy, and there is plenty of room inside for the plug. However, for handheld scanners the process is much more delicate. For the BC-235XLT, or similar Uniden product, use a soldering iron to burn a small hole in the side of the case for a RCA female plug. Drilling is not recommended as the bit might crack or break the case.

To get the hole the right size, use a small round file or continue burning with the soldering iron until the RCA female adapter fits snugly into the hole. Cut off the excess bubbled-up plastic with a razor blade.

Chose a location on the side of the case directly above the battery compartment where there is room on the inside for the plug and the retention nut, as in the photos below.





It is a tight fit, but it works great. For base scanners, there should be plenty of room on most models to drill a hole in the back of the case. Be sure to get all the metal shavings out of the inside of the scanner if you drill it. Note the location of the extra baseband audio RCA phono



jack in the middle of the photo below.

Connect the shell or outer frame part of the jack to the scanner chassis ground (not necessary if the chassis is metal). The case on the BC 235XLT is plastic, so run a wire to the ground on the antenna connection where it goes into the circuit board.

Next – and please read the rest of this paragraph before starting – carefully solder the (+) leg of a 1.0-uF to 4.7-uF Tantalum capacitor to the discriminator output pin. (Capacitor should be tantalum, but can vary in value from 1.0-uF to 10-uF at a voltage rating of 16-35 vdc.) 1-uF Tantalum: RS# 272-1434, 2.2-uF Tantalum: Catalog # 11295888, 10-uF Tantalum: RS# 272-1436. Then solder a shielded wire to the (–) end of the capacitor and run the distance to the inside pin of the RCA female plug. If the space is tight on the circuit board (which it is on the BC 230/235XLTs), you can solder a shielded wire to the output pin and run it to the capacitor as in the photo above. Then solder the (–) end of the capacitor to the inside pin of the RCA female jack. Just make sure the polarity is correct when soldering the capacitor.

## The Computer Connection

Now you are ready to connect a 2 level FSK data decoder interface that is easy to build with simple parts from Radio Shack. If you are good at reading schematics, follow the diagram for the 2 Level FSK decoder available on Lindsay's web page or on Bill Cheek's web site at: <http://www.comtronics.net/trunk.htm> (Note: R1 and R3 100k resistor's correct RS # is 271-1347, not 272-1437.)

However, if you are like me and reading a schematic is like reading Klingon, refer to the February 1999 issue of *Monitoring Times*, page 82 for an article by Bill Cheek. This article includes data decoder interface construction plans showing exact placement for each component both for the top and bottom sides of the circuit board. If you accidentally threw out this particular issue of *MT*, order the back issue (\$3 plus SASE), or order a copy of the *World Scanner Report*, V8N9 from Cindy Cheek. You can order back issues of *WSR* from Cheek's web site at: <http://www.comtronics.net/wsrinf.txt>

Cheek's plans recommend building this board into a DB-25 parallel computer port connector. Now, a man must know his limitations! So, I opted for the 3"x 2"x 1" enclosure box instead. Cheek also recommends using two or three ports on the computer or two computers wired together to run Trunker. I have had success running the program with only one port – the serial connector or COM port #1 on the computer. The schematic in the same issue of *WSR*, and available on-line, has the pin conversion chart from DB-25 to DB-9 connectors.

The photo on the right is a trunk-following setup. From right to left: a computer running Trunker or Etrunker, the discriminator-tapped scanner, the home-made decoder box, an OptoElectronics OPTOLINX, and the second scanner, an AOR AR-8000 scanner which reaction tunes to the activity on the computer screen.

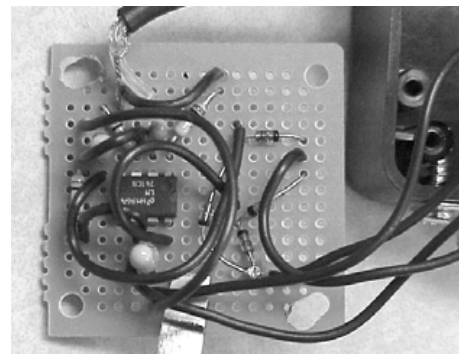
Stop by your local Radio Shack and pick up the following items to build the decoder box:

Project Box Enclosure 3x2x1 inches.  
6-ft Audio Cable (RCA male adapter)  
26-117B RS-232C Cable (male DB9 to Female DB-9)  
9 POS SUBD Plug, Solder-type Male  
9 POS SUBD Plug, Solder-type Female  
276-1513 Shielded Metalized Hood (2ea)  
148A ICB90 PC Board  
PK5 100k 1/4 watt resistor  
PK5 3.3k 1/4 watt resistor  
276-007 741 Mini Dip IC  
10-uF/MFD Tantalum Capacitor (2ea)  
1-uF/MFD Tantalum Capacitor (1 ea)  
PK50 IN914 Diodes  
22 gauge wire (black)  
278-1385 22 AWG Speaker Wire (optional)

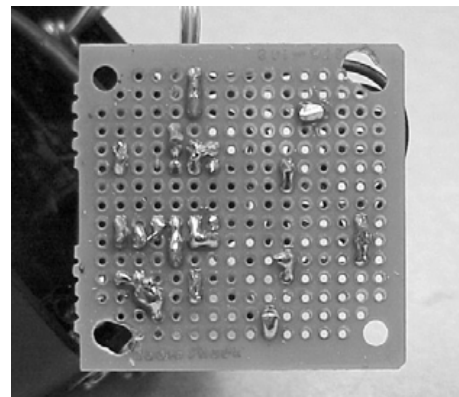
First, prepare the enclosure box. (See photos.) Use a Dremmel tool to grind out a hole in one end (the 2" end of the box, not the longest side) of the enclosure box to accept the 9 pin female plug. The hole should be shaped properly and large enough to accept the back part of the plug containing the solder connection pins. If inserted from the outside, the plug should fit tightly against the screw guide wings.

Drill two holes to hold the plug in place. It's a tight fit because of the screw guides inside the case, but secure the plug the best you can with either the small sheet metal screws or, better yet, with the small round head screws, nuts and washers listed below.

64-3016A Pan Head Sheet Metal Screws, Assorted Sizes (35)  
or  
64-3017 Steel Machine Hex Nuts 2-56 (40)  
64-3010A Round Head Machine Screws 2-56 (42)  
64-3022A Steel Flat Washers (Assorted)



Close-up view of component placement.



Close-up view of solder side of circuit board.

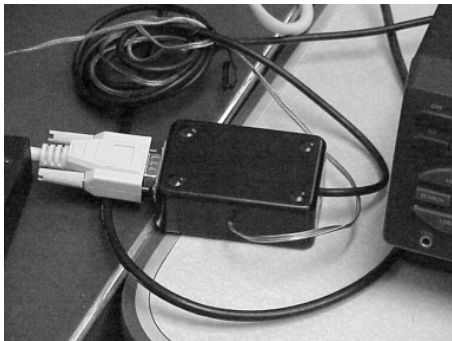
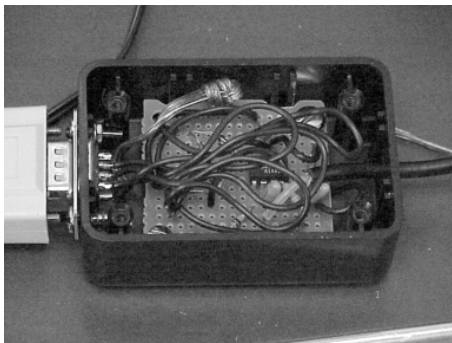


Drill a small hole in the opposite end of the box for the 420-2371 RCA adapter cable. Drill another small hole in either side of the long 3" end of the box for the wire that will run to the second scanner CI-V device. The following two photos are what the box looks like after construction.

Split the 276-148A PC Board in half. The PC Board will fit nicely into this box down to the level of the lower screw holes if you grind four half circles in the board where the ridges on the inside walls of the box are located. Minor elongating of two holes on the circuit board allows you to secure the board to the inside bottom of the enclosure box with two sheet metal screws after completing the board.

Prepare the solder side of the PC Board by running a pencil eraser over it several times. Use the 741 Mini Dip IC as a start point in the center of the PC board. Insert each component, and solder away. Cut and use small lengths of 22-gauge wire to connect components together as depicted in Cheek's construction plans. In some places on the board you may have as many as five or six





leads or components that need to be soldered together. It's easier to solder them all at once. Cut four longer lengths of 22-gauge wire to connect the proper locations on the PC Board to the listed pins on the DB-9 female connector. The pin numbers are marked on the DB-9 connector. Be sure to solder the wires to the correct pins.

NOTE: Weak base band problems in handheld scanners can cause poor signal strength or insufficient signal getting to the computer. I have discovered several enhancements to the circuit that have been of help. One fix is to replace the 3.3k resistor at R2 with a 1k resistor. The second enhanced circuit is to eliminate R3 completely and replace R2 with a 0.1k barrel capacitor. The later fix solved a problem of decoding VHF/UHF and 900 MHz trunked systems with a BC-235XLT.

Next, solder a six-foot length (or whatever length you need to reach the computer) of two-stranded wire (regular 22 gauge speaker wire will work: RS# 278-1385) to the TX and Ground pins (pins 3 and 5) in the DB-9 connector. On the other end, solder these wires to the same pins inside a DB-9 male connector. This connector plugs into the second scanner's CI-V or RS-232 device. Or, in the case of the BC-245XLT, it connects directly into the factory-supplied serial port remote scanner control cable.

This signal tells the second scanner what frequency to tune to so that information on the computer screen can be monitored. Check recommends using a RS PRO 2004/5/6 scanner with a CE-232 device for the second scanner. Unfortunately, Radio Shack no longer produces these models and they are very difficult to find, even in the pawn shop circuit. The author uses the OptoElectronics OPTOLINX and an AR AOR-8000 scanner, or more recently, a Uniden BC-245XLT scanner.

Once you have checked all your connections and solder points, stuff everything into the enclosure box and screw on the lid. Plug the male end of a PC serial cable (RS # 26-177B) into the box and the female end into the serial port on your com-

puter. Plug the RCA male adapter into the back of your discriminator-tapped scanner. Plug the male DB-9 into your second scanner's CI-V controller or supplied cable, then tune the discriminator scanner to a control channel.

You may want to test your new data slicer first by using a freeware program called SLICER.EXE by W.A. Porrett, available at: <http://home.ica.net/~phoenix/wap/slicer.htm>

## The Software Connection

After you have determined that your computer is receiving a reliable signal, start Trunker or Etrunker with the following batch file (trunker.bat), or something similar:

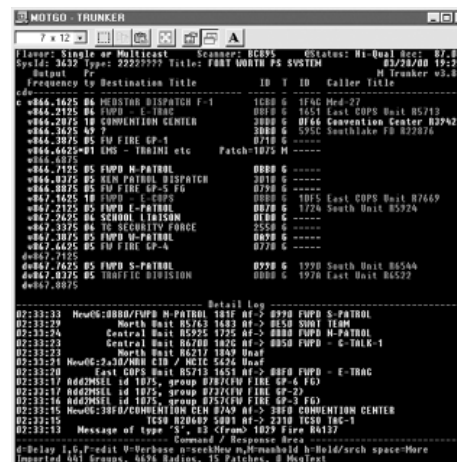
```
set TRACKSLICERPORT=COM1
set TRACKSLICERPIN=CTS
set TRACKSLICERMODE=INVERT
set TRACKSCAN=AR8000
set TRACKSCANPARK=972.100
set TRACKSCANBAUD=9600
set NOEMERGENCY=TRUE
trunker.exe
```

Hopefully, if you are monitoring an 800 MHz Motorola system, you should start seeing frequencies appear along with a SysId and Type, Title "unknown," and a signal strength. If not, try checking your batch file settings as per the Trunker/Etrunker documentation.

If you are using an AOR AR-8000 for your second "remote" scanner, please read on, otherwise skip to the next paragraph. If your AOR is modded with a phono plug for the OptoElectronics SCOUT, connect the phono plug on the AOR to the "Half Duplex" plug "A" on the front of the OPTOLINX. This seems to work better and is more reliable than the supplied flat cable. All four dipswitches on the back of the OPTOLINX should be in the down position. Also, inside the AOR's internal memory, the RS232 parameter has to be set to "CR" in the configuration menu. This is accessed in the "EXPERT" mode as stated on page 101 of the AOR manual. The AOR now acts as the second scanner and follows the talkgroup frequencies that appear on the computer screen.

To use the BC-245XLT as your second scanner, connect the factory-supplied serial cable to the DB-9 connector you ran out of your decoder box. Set the baud rate to 9600 in the remote menu in the BC245 internal memory. Turn off the scanner and turn it back on. Hit the manual button, then hold down the "E" or REMOTE key for two seconds; the small flashing key will come on. Note that the scanner has to be in Manual mode in order to get it to go into the remote mode. Also ensure that you have the TRACKSCAN parameter set to "BC245" in your batch file (see below for example), or your BC245 will stare back at you and do nothing!

```
set TRACKSCANPORT=COM1
set TRACKSCANBAUD=9600
set TRACKSCAN=BC245
set TRACKSLICERPIN=CTS
set TRACKSLICERPORT=COM1
set TRACKSLICERMODE=NORMAL
set TRACKSCANPARK=139.100
trunker.exe
```



**Screenshot of the Fort Worth Public Safety TRS shortly after the tornado tore through downtown Fort Worth March 28, 2000 (Screenshot compliments of Lindsay Blanton).**

Well, if you have made it this far and no smoke has come out of either your scanner or the data slicer, you are in business! By using Trunker, Etrunker and TREPORT you will now be able to scan for new systems or gain information about unpublished systems in your area. This information can then be used to help program your TrunkTracker scanner – Great combinations for any listening shack!

Some things to keep in mind: Trunker and Etrunker work best in DOS, and will run twenty-four hours a day on 486/DX 25 machines and up. On faster PC machines (Pentium-133 and up), Trunker will run just fine in a Windows DOS shell. However, Etrunker almost always has to be run in DOS, even on very fast processor machines. Interference caused by nearby PCS and/or pager towers can reduce the signal quality and thus adversely affect performance of the programs.

## About the Author:

Mark Colborn is a Sr. Cpl./Pilot with the Dallas PD Helicopter Unit and a UH-60L Blackhawk Instructor Pilot in the Texas Army National Guard. Mark's main hobby is amateur radio and monitoring many types of communications, especially with the aid of a computer. Mark believes that responsible citizens have the right to monitor routine police and military radio communications, and thus stay informed about events transpiring within their communities.

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# Meet WJCR

By Hans Johnson

**S**hortwave station WJCR of Upton, Kentucky, is part of the dream of Gerri and Pastor Don Powell. The Powells first became involved in radio in the late 1980s, when they wanted to have a Christian radio ministry. FM was the direction in which they first turned. After a short visit to Kentucky, they found and purchased a piece of property for the station near Millerstown. They duly put in an application with the Federal Communications Commission (FCC) for a large 100,000 watt station.

Sadly, Don was suffering from life-threatening health problems at this time and their application lapsed. They had to submit the application all over again, but with perseverance and faith, the Powells got on the air with a 100,000 watt station – WJCR FM – in 1990.

The Powells still wanted to reach the entire

A second transmitter was added in 1994. Both were operated 24 hours a day on single frequencies, 7490 and 13595 kilohertz with the same programming.

## New Wine in Old Wineskins?

The transmitters were built from the bodies of very old RCA Ampliphase AM transmitters that were modified for use on shortwave. They apparently were just too old, and WJCR had quite a number of problems keeping them on the air. They couldn't run them at their full power of 50,000 watts and the only source for spare parts was other junked RCA transmitters.

WJCR eventually gave up and relegated these transmitters to back up status. In 1999, they replaced them with two Continental 417A 50 kW transmitters that they obtained them from the city of Bethany, Ohio (which took over the old Voice of America [VOA] shortwave site once located in Bethany) in exchange for a \$15,000 donation to the museum fund for restoring the old VOA site. WJCR did some minor repairs. After putting in new final and drive tubes, the transmitters worked fine. So Bethany lives, albeit from Kentucky, not Ohio.

In addition to the four transmitters, WJCR has three rhombic antennas. The main ones used are 55 and 155 degrees. There is a rhombic for 270 but it was only used for a now-discontinued service for China.

## Programs

WJCR now broadcasts entirely in English. Several years ago, there was a service to China, but China is a long reach for a 50 kW transmitter from Kentucky. Additionally, the rhombic antenna used for the service was pointed in the wrong directions, with its alignment apparently based on a regular map rather than a great circle path map.

WJCR has considered other foreign language services, including a Latin American Spanish service using a rhombic an-



Master control room in "Shortwave Building."

tenna and another service for China. For whatever reasons, these plans have not come to fruition.

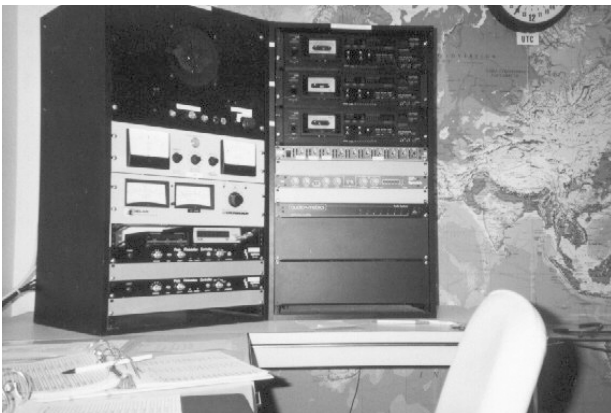
Much of their programming is Christian gospel music and there are some Christian teaching programs. The Prayer Line program is still on the air as well. Gerri says that WJCR does sell airtime for Christian programming, but that sales have been slow and that "many people aren't interested in buying shortwave time."

WJCR can be heard 24 hours a day on 7490 and 13595; 13595 was off of the air due to a transmitter fault, but should now be back on air.

WJCR is very friendly to shortwave listeners. The station responds quickly to reception reports with its own QSL card and reports can be sent in via email. The station also welcomes visitors; you'll find directions on their website.

Reception reports can be sent to [wjcrfm@earthlink.net](mailto:wjcrfm@earthlink.net) or to P.O. Box 91, Upton, KY, 42784, USA. Their website is at <http://www.wjcr.com>

*My thanks to Larry Baysinger and the Powells for their assistance in preparing this article and to Larry for providing photographs.*



Modulation and frequency monitoring equipment and program automation audio equipment.

world. At first, they thought this would be via satellite. After meeting with various experts, they realized, however, that a satellite service wouldn't reach that many people.

The Powells then tried shortwave, purchasing time on a few American shortwave stations to air their most popular program, Prayer-Line. Impressed with the response, the Powells decided shortwave was the best means for their world outreach.

With the FM station as a continuing financial anchor, the Powells began construction on their own shortwave station. They breezed through the FCC regulatory practice and maintained steady financial support through substantial donations. WJCR "Where Jesus Christ Reigns" began transmission in March 1992 at the same site as their FM station.

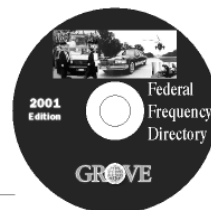


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### Roll Your Own DXpedition

I had a friend once who was an avid AM band DXer. What he liked to do was take his trusty Zenith TransOceanic portable radio, well stocked with fresh batteries, to a hill out in the countryside. He would sit in the crisp autumn air as the sun went down and methodically dial back and forth across the AM band trolling for new catches. With a flashlight, pad and pencil he would log in unfamiliar calls and note programming details. Later, in the warm confines of his listening post he would track down the particulars of the new stations he'd heard and send off for QSLs.

He had several things going for him on these AM band "DXpeditions." First, he was far away from anything which might cause medium wave interference and he was listening at the time of day when "daytimers," AM stations allowed by the FCC to broadcast only during daylight hours, were still on the air as the band was starting to "stretch out." Distant low power AMers, which would ordinarily not be heard, could be logged with relative ease. By doing these DXpeditions in the fall he was also taking advantage of the beginning of the quiet part of the natural noise cycle on the band.

Since getting my ham ticket 13 years ago I've enjoyed doing two-way radio DXpeditions.

Usually I would take my transceiver, a wire antenna, a motorcycle battery and a transmatch (antenna matching unit) to the nearby Blue Ridge mountains. Parking the car on the Skyline Drive there would usually be a half hour or an hour long hike up the side of a mountain to a place just off the Appalachian Trail. Here, with a beautiful view of the lush mountainsides below and the clear skies above, I would set up my ham station. I would also bring along the usual picnic supplies in addition to a log, pad and pencil.

Everything for the station would fit in a backpack and I'd carry a small cooler which held the lunch and would also double as a comfortable seat with the rig perched on a rock and the antenna stretched between two trees. Calling CQ with five watts into an antenna at 3,500 feet and having someone come back to you from 10,000 miles away is a real thrill.



*Field Day 2001 gave me an opportunity to try out some minimal station ideas. The entire station including transceiver, transmatch, battery, solar panel, associated cables, wire and microphone fit nicely into the cooler with room for lunch. (Courtesy Author)*

perched on a mountain top sipping hot coffee and working stations in England while surrounded by a panorama of natural beauty holds a very similar appeal.

#### ◆ Getting Started

Whether you're a shortwave listener (SWL), AM DXer or amateur radio operator, you should consider taking some time this fall to mount your own DXpedition. Pick a Saturday or Sunday in the next couple of weeks and take out a map of your area. Look for mountaintops or seashores – any place to which you'll enjoy traveling even if the bands aren't cooperating.

If you're only listening, your packing will be a lot lighter. With only a portable radio and a roll of wire you'll have plenty of room for extras in your pack.

If you're planning to do two-way communications you'll have to pack carefully. Planning to work the higher frequency HF bands is recommended since 10, 15 and 20 meters require relatively little in the way of antennas and those bands are usually cooperative at this time of year. If you have a transceiver capable of six or two meters on Single Side Band (SSB) you might find some really interesting contacts. Those two bands also lend themselves well to small antennas, altitude and line-of-sight contacts.

If you're planning to transmit, you may be surprised at what little you'll need in the way of antennas. This June, during Field Day exercises,



*Bill McCoy, KE4JSU, operates Field Day 2001 with a state-of-the-art Icom IC-706 MKII-G. This diminutive transceiver is actually smaller than the MFJ Versa Tuner III transmatch on which it sits. Not only is it a general coverage receiver (with 107 alphanumeric memories), it transmits on 160-10 meters on HF, 6 meters and 2 meters VHF and 70 cm UHF. Weighing just 5.5 pounds it could be the perfect DXpedition all-purpose radio! (Courtesy Author) See MT review June and July 2001 - ed.*

The best part was that I'd always do this with my daughter, who was 12 years old at the time and we'd enjoy taking turns at the rig (she used her own log book and call sign). While one person was DXing the other could be relaxing in the sun or wandering down the Trail and checking out the abundant wildlife.

Planning a DXpedition can be a fun way to interest a youngster in your family in the fun of radio. Again, I prefer the fall or spring for DXpeditions which afford comfortable weather and generally good band conditions, particularly on 10 meters which requires a relatively small antenna and very little power to span the globe.

Some folks like to fish and I can fully understand their addiction. Spending a few hours



I took my Kenwood TS-140S out to a secluded place on the property and set up the station. I wanted to test the limits of how little I could get away with in the antenna department, so I brought along a 75 foot roll of magnet wire [RS #278-1245 gives you three rolls: 40' of 22 gauge, 75' of 26 gauge and 200' of 30 gauge – all for \$4].

This wire is so small that a 75' roll of it can get lost in a shirt pocket. I chose the 26 gauge because it was long enough to toss up into a nearby oak tree. Tying a rock to one end, I hurled that end, sling style, into the tree about 50' up. To my surprise it caught on a branch and within seconds my DXpedition antenna was up!

I bared the wire on the other end and fastened it to the random wire post on the transmatch. After setting the transmitter output to 5 watts I tuned the transmitter to the 17 meter band (18.068 to 18.168 MHz), checked the Standing Wave Ratio (SWR) on the transmatch, and noted that this little piece of wire was less than 1.8 to 1, an excellent reading. Then after tuning around I answered someone calling CQ. It turned out the station calling was doing exactly the same thing I was, only he was in Minnesota at a campground and had just set up his station outside his RV.

For the next five hours, using 75' of wire hanging up in a tree, I worked stations in two dozen states, three Canadian provinces (from the Maritimes to BC) and two DX stations (Poland and Russia) on 40, 20, 17, and 15 meters. By the way, the international broadcasters came

through really well, and though I didn't hunt for anything unusual it was clear that I wouldn't need much else for serious SW or AM band listening. (See Aug *On the Ham Bands* for more outdoor DXing tips - ed.)

### ◆ Variations on a Theme

There are so many different ways you can do your own DXpedition. If you have a Technician class license you can still have a lot of fun "mountain topping" on the VHF and UHF bands. One way is to make a 2 meter or 70 cm beam antenna and clamp it to a camera tripod. By rotating the beam on the tripod you can zero in on distant repeaters in places a hundred miles away or more. If band conditions are right there's no telling what you can hear. By mounting the antenna in a horizontal mode you can work the side band portion of 2 meters and work stations simplex (both stations sending and receiving on the same frequency).

You can do this with a scanner, too. By situating yourself between two major cities with decent enough elevation you may be able to hear all kinds of services unheard of in your own locale. By rotating the beam from one to the other you'll get in on all the action in both cities.

Another favorite is to take a homebrew QRP (low power) transceiver into the wilderness. Not only is the equipment lightweight and small, but it requires nearly nothing for a power supply. The whole station could be packed in

something about the size of a shoe box. Some QRP operators pride themselves on the extremes to which they go to have an operating station in the smallest container possible.

Working the amateur satellites (AMSATs) from a DXpedition site is another way to have fun. Yet another is to downlink the polar orbiting weather satellites. You can even try to monitor the International Space Station from your site. All it takes is knowing approximately when the satellite will be over your area and being ready with whatever it takes to receive.

Make a brief schedule of when you'll leave for the site, approximate time to set up a station, and establish a limit on the amount of time you'll operate. Don't forget that once it gets dark it may not be easy to navigate mountain trails or find the car. It's easy to get disoriented in the dark and on unfamiliar terrain when you're tired. Allow plenty of time for the trip back to the car from the site.

Lastly, make a little journal of the event or at least make notes in your log as to the place, time, temperature, or anything else which might seem interesting or help you in planning future trips.

One of the fun parts of the radio hobby is that you don't have to leave it behind when you take trips, and you can even create a trip just for your hobby. The point is that your imagination is the only thing you need besides your radio gear. Above all: have fun!

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**Q.** Several terms I've encountered need further definition; can you help? (Kenneth Pearson, Freehold, NJ)

**A.** I'll try:

AMPS: The conventional 800 MHz Advanced Mobile Phone Service (analog cellular) band  
DCS: Defense Communications System  
ESMR: Enhanced Specialized Mobile Radio  
ISM: Industrial, Scientific, Medical frequencies for non-communications use  
Microcellular, picocellular: Using an agile, digital, cell phone for outdoor and inter-office use  
PWC: Personal Wireless Communications  
Direct Link antennas (Cushcraft): Brand of antennas made for picocell systems

For additional information, look these up on your favorite search engine.

**Q.** I have used a Zenith Trans-Oceanic Royal D7000Y for years for short wave and medium wave listening; would I really benefit moving up to the Grundig Millennium 800? (Gerald Silver, Tamarac, FL)

**A.** The Trans-Oceanic series enjoys a place of reverence among radio collectors; they were excellent in their day. The value of the 1973-1979 model you own is about 1/3 the cost of a new Grundig Millennium 800, so is it worth trading up?

Yours has selectable IF bandwidth, as has the 800. Are you interested in SSB for listening to two-way communications like hams, ship to shore, air to ground, etc.? Would the addition of FM broadcast and VHF aircraft bands be an advantage?

The Grundig's ability to memorize most-listened-to channels may be useful, and the audio is excellent with the internal speaker. Sensitivity is probably better, and signals won't drift or need occasional touch-up peaking as on your old Zenith.

Direct frequency entry and exact digital readout is a nice feature, and all the components are fresh, not aging as in your three-decades-old receiver, contributing to drift, erratic switching, tuning backlash, control noise, increased background noise, low sensitivity, broader selectivity, perhaps some audio distortion, etc.

These are some of the trade-offs. I, too, like the old Trans-Oceanics, but I wouldn't compare them favorably to the Millennium 800.

**Q.** My BC895XLT loses all frequencies while I'm parked at Wal-Mart; it's done this five times. And it's happened to my other BC895XLT at home while I'm away. Is it a prankster, or is this something that this model does? (Bud Stadler, Joshua Tree, CA)

**A.** I'd say it's a prankster. Such a frequent occurrence on two identical scanners – while you aren't watching them – is just too unlikely. Of the enormous number of BC895s we've sold at Grove Enterprises, I've never had a loss-of-memory complaint like this. Resetting a Bearcat to all zeroes is extremely simple and quick; somebody's playing with your mind. If not, I guess you'll have to stop shopping at Wal-Mart!

**Q.** Why is it I can't pick up AM broadcast band stations west of St. Louis from North Carolina, even during grey line propagation? (Chris Francis, Angier, NC)

**A.** Some years ago, the FCC authorized daytime stations to go on low power at night. Many once-clear channels thus became cluttered with these nighttimers. While distant target signals are stronger at night, so are the closer interfering signals.

**Q.** Is it lawful to buy, import, own, or resell a cellular-coverage scanner made before the current restrictions forbidding them? (Frank David)

**A.** Absolutely, provided it bears an ID label indicating it was FCC approved at the time of manufacture. However, scanners like Yupiteru which were commonly imported before and after the 1994 restrictive legislation have not been FCC approved, and are therefore contraband.

A grey area includes those scanners bearing an FCC ID label, but which have been modified to receive cellular frequencies. The modification voids the FCC approval.

From a practical standpoint, the wording of the legislation refers to "marketing," which implies quantity, an on-going business. It is highly unlikely that a single sale between private parties is likely to raise eyebrows.

And, while it is possible that a person could be reported for owning a cellular-modified, and therefore disallowed scanner, unless proof can be established that it has been misused for unlawful purpose, prosecution is unlikely, and there

have been no reported cases.

The furor has died down from the politically-inspired Newt Gingrich cellular-intercept incident which sparked the witch hunt roughly four years ago, and our illustrious Congressional representatives have moved on to other more pressing matters.

**Q.** What exactly is the hazard when one is driving past a highway construction site, and a sign says, "Blasting Area. Turn Off Two-Way Radio?" Is there really a danger of CB or amateur radio frequencies setting off an explosion? (Mike Breckinridge, N1JXP, Calais, Maine)

**A.** The warnings are due to the possibility that electric blasting caps might be accidentally detonated if enough current is induced into the wiring to them acting as receiving antennas from a powerful mobile transmitter, like a CBer with a 10 kW linear!

The actual threat is minimal, and depends on the power of the transmitter, the distance to the wiring, the frequency of the transmission, and the length of the wiring.

While there have been rare instances in the past of accidental detonations, I'm not convinced they were traced to a drive-by transmitter. But it's better to be safe than really, really sorry!

**Q.** Aside from the seven well-known NOAA weather channels, what are the three international weather channels? (Nate Mister, Galloway, NJ)

**A.** The well-known seven, from 162.400-162.550 MHz spaced every 25 kHz, are the only nationwide NOAA/National Weather Service channels. In addition, two Canadian Great Lakes frequencies (161.650 and 161.775 MHz) and an auxiliary 163.275 MHz NOAA channel make up the total of 10 channels often advertised on weather-capable aircraft and marine radios and scanners.

Questions or tips sent to Ask Bob, c/o

MT are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT, or e-mail to bgrove@grove-ent.com. (Please include your name and address.) The current Ask Bob is now online at our website: [www.grove-ent.com](http://www.grove-ent.com)

## ARE YOU READY FOR SOME FOOTBALL?!

If you attend a pro or college game, your frequency finder or scanner (no antenna necessary) will find some interesting frequencies for your listening pleasure. Bring your earphone. Well, let's get started.

63

Well, the kids are back in school. Whew, I thought my nephews would wear me out. I always like to keep an eye – I mean an ear – on them. I found the frequency for their school bus as well as the principal at their school. Most schools now use two-way handheld radios to communicate between administration, security personnel, custodians, and teachers. Many use FRS or off-the-shelf business band radios. You should try to discover the school frequency just in case something ever breaks loose. I hope I never hear my nephews' names.

64

This month we have some excellent ideas sent in by Robert from Toledo. Clearly he is a tinkerer after my own heart. While performing electronic fixes or simply repairing cosmetic damage, you always need the right tools. Robert speaks glowingly of his favorites:

- The "unibit" is an inverted cone shaped drill bit that enlarges "precisely" any pre-existing screw hole.
- A hot melt glue gun for variety of needs.
- Screw extractors for removal of screws that are stripped or broken.
- A left-hand spiral drill that runs in re-

verse for backing out screws.

- Pliers that have a cutter, crimper, stripper, and special cutters that will cut screws "without" damaging the threads. Check with your local Graybar supply house.
- The new cordless screwdriver from Black and Decker that includes the adapter to use both 1/4 and 3/8 drive sockets.

Robert laments that plastic nylon ties are not what they used to be, and many disintegrate from the UV. Plan on replacing them every couple of years.

He believes that to do the job well, you must have the right tools. Amen. Robert finds his tools in the catalog from Walter Gogel Company at 1819 N 13<sup>th</sup> St. in Toledo OH, 43624. Website is <http://www.waltergogelco.com>. Their number is 1-800-837-7800. Thanks for the tips, Robert.

65

I have another suggestion for a company with small, specialty tools. Try the catalog from Micromark® at 1-800-225-1066 or <http://www.micromark.com>.

Eyeglass repair kits often carry the small Phillips and regular screwdrivers plus some extra little screws.

Any refurbishing project needs alcohol preps, an old toothbrush, "Goo Gone" fluid, plastic rubbing compound and restorer, toothpicks, and cotton swabs. Armed with these, you can make most radios look like new – an important consideration if you use them as a collection for public display. How do your radios look?

66

As summer ends, there are usually some bargains for tents, screened rooms, and folding chairs.

All these items are often used in support of weekend radio DX outings. I especially like the new folding fabric chairs with a storage tube carrier. Most have a drink holder in the armrest that is perfect to hold your hand held radio. Only a seriously disturbed hobbyist would keep radios in BOTH drinkholders. About \$10 at your local discount store.

67

When I program my scanners I try to put them in numerical, ascending order. My Pro 64 will automatically do this for me under the Auto function. My Pro 26 will scan them in ascending order when I use the "Auto" key function. I can only hope that, being logical, the processor will scan faster when the frequencies are in order. I do this by bank, not the entire 300 (or whatever) memory channels. Therefore,

I do this on all my scanners. On my Scancat software, there is also a sort function. Look for Sort, then Ascending. I realize that not all CPUs will benefit from the programming order, but it SEEMS faster. Plus, it is easier to find frequencies if they are listed in numerical order.

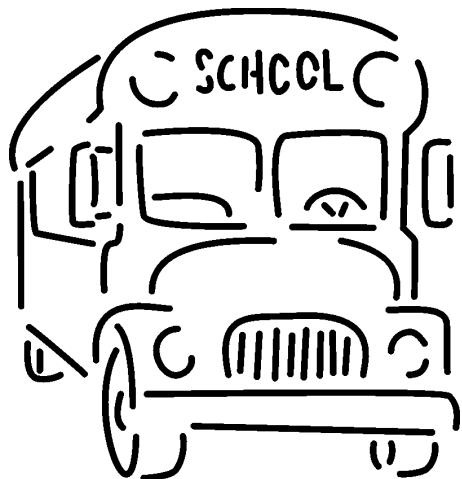
68

I keep my oldest most beat-up scanner in the car. If it gets stolen or damaged, oh well. It is a tradeoff against making certain I always have a radio onboard. In fact, I use an old ADI 201 transceiver, so I have both scanner and transmitting capabilities.

You might notice that I have added my regular mailing address to the heading at the beginning of the column. I would much prefer correspondence via email. If you do not have Internet access, your local library does. Nevertheless, if you prefer to write me, you can do so at the PO Box shown. Your suggestions, bright ideas, and comment are always welcome.

If you are writing to request a copy of the ham radio questions and correct answers, the cost is \$6 per exam. I have materials for the Technician, General and Amateur Extra. The question list runs about 40 pages and cost about \$3 to mail. You can see I am doing this at costs. Via email, it is still free.

A better Bright Idea: Radio Shack and others sell the book for \$10. If you buy the book, just highlight the correct answers the first time through. Cross out and do not read the wrong answers. If you already have a list of the questions, please pass it on to a friend so they too can enjoy the privilege of an amateur radio license.



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### Canada Calling

**T**his expanded edition of *Scanning Report* brings us Emergency Management Plans, a high school classroom and Canadian scanning. Thanks again to Ken Windyka, who continues to provide us with great information from the northeast states, as well as to Mike Comer in the Space Coast area of Florida for his extensive list of fire-fighting frequencies.

#### ◆ Bank Number One

"Canada Calling," with host Prior Smith, is a broadcast radio show aired throughout Florida in the winter months. The show provides "back at home" news and feature information for our Canadian visitors. While Canadian tourists in Florida are a little out of range for hometown scanning, a variety of Canadian frequency websites are available for their research. For the hobbyists in Canada, the websites provide guidance and reference toward the country's varied communication systems. Note: site links appear at the end of this column.

Chuck LeBrocq, a longtime subscriber living near Toronto, recommends the **Ontario Radio Frequency Directory**, by Ron Katz, and the companion "OntScan" Internet mailing list. The OntScan site includes a comprehensive emergency services frequency list (site registration required for password), plus supplemental lists (no login required) for airports, railroads, Amateur Radio, Family Radio Service, AM Broadcast stations and business channels. Trunked systems and low power radios are also covered. OntScan has extensive links to radio industry websites, news media outlets, other scanning directories and a variety of scanning discussion forums.

The **Technical and Administrative Frequency Lists** (TAFL) website contains dozens of files related to licensed radio operations. Files are available for download by frequency range, geographic region, or station class. A linked website, **Spectrum Direct**, allows for frequency searches. Sensitive government channels are excluded.

The **Ontario Unlisted Frequency Guide**, by Matthew Stone, boasts frequency lists that are not covered in the TAFL files. Dozens of channels are listed, from low power radios at business locations to a roadway traffic camera operating at 2433.0 MHz! Matthew includes a detailed page of links for Canadian frequency websites from coast to coast. A mailing list is also supported.

Steve Jones reports, "I myself started the

**Scanont mailing list** over 2 years ago. I recognized a need for a place where scannists in Ontario can get together and share information. The mailing list format allows us to share frequencies and notify others of events happening in near real-time. The list is open to all and currently we are approaching 350 members." Scanont is available on the Yahoo Groups server.

**Scanner Centre** is recommended by Sheldon Harvey. "Another good resource is the Canadian Frequencies page in Scanner Centre, sorted by province/territory." The site also has a nationwide section of common CB, Marine, and Railroad frequencies.

Mike Agner researched many websites and offers these gems:

- **My Scanner Page** has listings for British Columbia as well as Washington, Oregon, Idaho and Montana.
- **The Saskatchewan Scanner Page** is, well, colorful in its presentation.
- **Alberta Scanner Pages** include detailed categories and usage notes.
- **The Edmonton Area Scanner Enthusiasts** (EASE) site has a fresh design and is "easily" navigated. Frequencies, meeting notices, software and message sections are included.
- **The Eastern Ontario Frequency Directory** covers Eastern Ontario and Western Quebec with in-depth geographic information and category listings.

Finally, for those who have some empty wall space and love colorful graphics, the "**Radio Spectrum Allocations in Canada**" chart is for you. An Adobe Acrobat version is available for download...see the website links section of this column (Table One).

Each site provides an excellent view of their particular geographic area. Beyond that, coverage depends on the author's personal interests. Business bands are covered most frequently, from low-power, drive-thru radios at McDonald's to large industrial complexes and corporate systems. The VHF aircraft band is well represented, but UHF air and MilCom are notably absent. Trunked systems are discussed at length along with appropriate software and radios.

The Ontario Unlisted Frequency Guide includes a different twist: the author has a table of locations and businesses he'd like to have in his frequency list...but he hasn't found any verifiable information on them. If you're in the area and want to help in his "wish list" investigation, please contact him.

A "community spirit" is fostered by many sites, using a combination of local forums, FAQs, meetings, mailing lists and patron-supplied updates. Some sites are even sophisticated enough to become "home pages" for users, since they include news and weather links, traffic information, event schedules, search engines, messaging and related features. Canadian residents and tourists alike should find more than enough information to program a scanner and enjoy the sights...I mean sounds...of Canada.

We thank everyone for the great response to the request for Canadian information. It is a great opening salvo for our new *Canada Scanning* column by John Corby, which will explore the diversified geography and radio systems of the country. Look for his knowledgeable reports starting in this issue, and support his efforts as you have mine.

#### ◆ On-Scene Commander

This month is extremely active for hurricane monitoring in the southeast states and for Fall/Winter equipment preparation in the northern regions. Emergency Management agencies *always* have a communication plan for severe weather events, and these are "public record" documents which *you* are allowed to inspect. Call your local Emergency Management jurisdiction (municipal, county or state) and arrange for a facility tour and inspection of their "Comm Plan" before a disaster strikes.

The Comm Plan will inventory the responding agencies, equipment resources and deployment timetables for an emergency. You'll also find out "who's in charge." Emergency circumstances sometimes change the normal roles of Police and Fire Chiefs, Mayors, Commissioners, administrators and staff members. Without knowing the plan, you may hear some communications that appear quite strange!

If you're young and energetic, sign up to be an official volunteer so you can help your community recover from a disaster. Furthermore, if you run a company, please consider sponsoring the agency if such a program is in place. It's hard to believe, but many Emergency Management departments operate on a shoestring budget *until* a disaster strikes...only then are local funds reallocated to the emergency. Some departments don't even have money for coffee pots in the Emergency Operations Center (E.O.C.), and local businesses can easily contribute these types of assets.

When reading the Comm Plan, you'll probably find a variety of interesting sections and ap-



pendices. Look first for an inventory of responding agencies: Police and Fire-Rescue will certainly be represented, but also look for other local departments and a list of pre-emergency, during-emergency, and post-emergency responsibilities.

For example, a Public Works or Highway Maintenance department may implement 12-hour shifts and move heavy equipment to a central staging area in the 24-48 hours prior to the expected arrival of a severe storm. A skeleton crew of workers may be assigned to the equipment yard during the storm, followed by first- and second-shift callouts during the post-storm recovery period.

Recovery crews are usually assigned to geographic regions and/or certain recovery tasks, such as "Northeast Quadrant of City - Debris Removal from Roadways." Some efforts may be conducted by individual departments, while others are handled by teams of Police Officers, Firefighters, Paramedics, equipment operators and laborers traveling together as a "task force."

Communication equipment is vitally important during all phases of a storm, and most Emergency Managers conduct annual drills and training sessions to test equipment, procedures and personnel. This is another opportunity for volunteers to serve those agencies that delegate tasks between full-time employees and the volunteer corps.

Frequencies are abundant in most Comm Plans. You'll find police, fire, administration, government services and mutual aid listings. Plans often spell out even the most basic communication parameters since workers from other jurisdictions may have to read and follow the Plan's directives. Look for input and out put frequencies, simplex or "talk-around" frequencies, channel numbers and usage notes.

Large communities may also have a special section dedicated only to Mutual Aid communications. Look for channels identified as "Common," "Statewide," "Intercity," "EOC," or similar titles. Also of interest are special links to utility companies or large industrial plants. If you live near a nuclear power plant, for example, the E.O.C. will have one or more dedicated links to the facility. These may be in the form of local government channels, utility company channels, or special "hot line" phone systems.

Nuclear and chemical facilities also have siren and public address systems surrounding the plant and adjacent communities. If you have these nearby, look at a speaker/siren mount (usually on a pole or building) and see if an antenna is nearby...many siren and speaker systems are fed by a radio signal from the E.O.C. In Miami-Dade County, Florida, 470.3375 MHz, licensed to the county as a local government channel, was used for many years in this capacity. Check your local government and utility company listings for a licensed frequency with little or no activity...it may come alive during drills or actual emergencies.

Continuing with the Comm Plan example, Miami-Dade County also uses radios for emergency shelters located in schools and government buildings. The Amateur Radio community volunteers for these tasks, and their radio network is listed in table two.

### ◆ Who's Listening?

Jan Fine is a high school teacher and avid radio hobbyist. In the "early days" of crystal sets, he collected as many crystals and frequencies as he could...often in conjunction with local Radio Shack store managers who wanted to expand their offerings (and sales) beyond the local police and fire channels.

Jan amassed the information and started producing a typed list that was sold in some stores and radio shops. The frequency lists became distributed throughout the U.S. as personal computers, bulletin board systems and e-mail emerged, and he still sees portions of these classic lists in other publications and Internet websites.

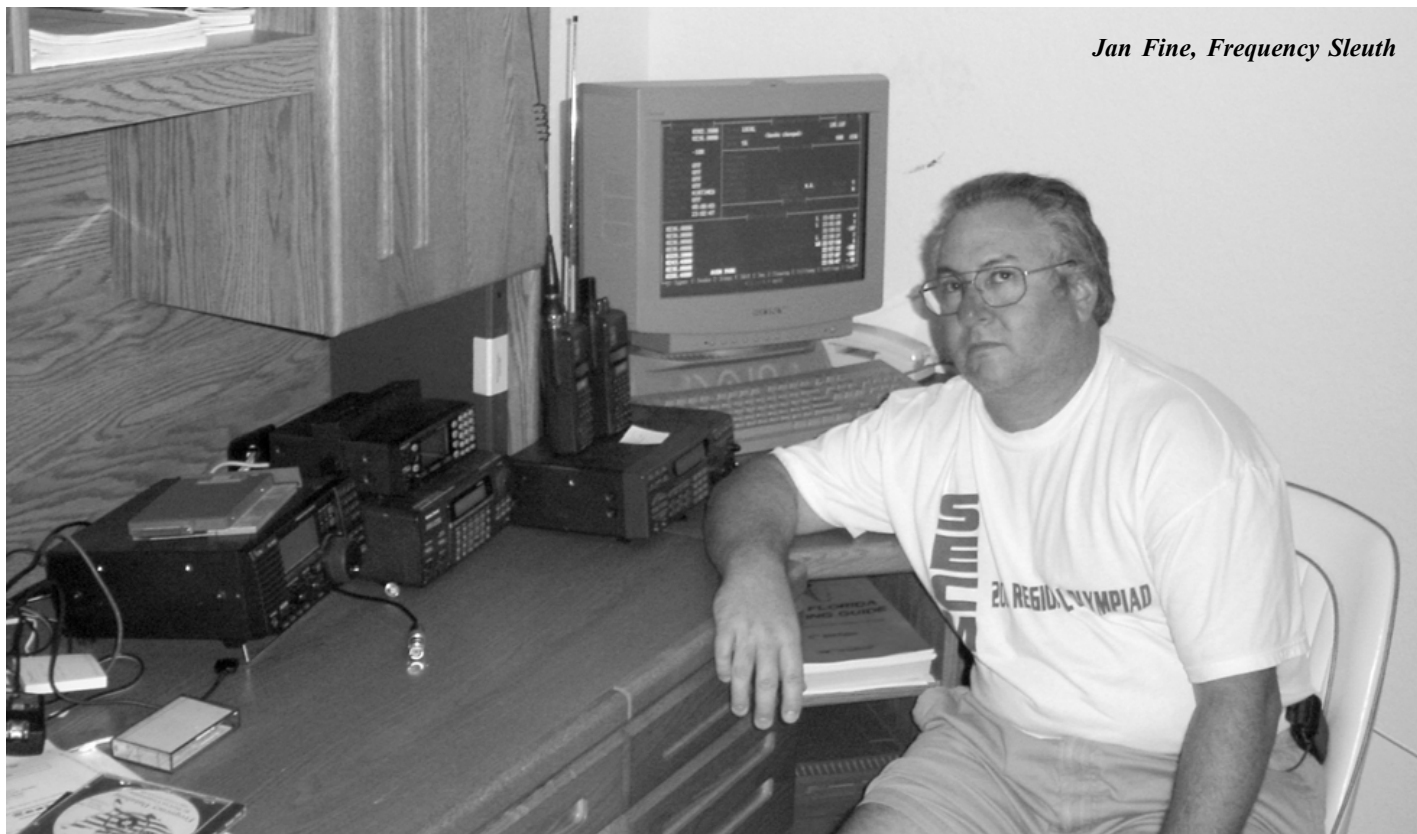
When programmable scanners appeared and the hobby blossomed, Jan was one of the first RCMA members and, some years later, one of the first subscribers to *Monitoring Times*. In 1990s, Jan and his family started "scanning vacations" to visit new areas and collect more information. He has traveled all around Florida and the southeast, visiting many military bases, museums and tourist areas...always with several scanners in tow.

Today, Jan devotes his time to his *South-east Florida Mailing List* on the Yahoo Groups internet server. His list hosts over one hundred members and serves the needs of the local scanning community.

For him, the hobby started in 10<sup>th</sup> grade. An Air Traffic Controller lived across the street and he gave Jan an old, tunable radio. Ship to shore communications were first heard, then Jan discovered the police band! A year later Jan purchased an eight-channel, crystal controlled scanner that he had been eyeing for some months.

Being an industrious, goal-oriented individual, Jan did something extraordinary: He began to "hang out" at the City of Miami Police Department, where they still had an old-time "Press Room" that piped-in the City's dispatch channels. It was here that he found the City's radio code list and, as you may expect, started a lifelong project of collecting codes, jurisdiction maps, unit numbering schemes and frequencies.

Jan has used the Bearcat 8, Bearcat 101,



*Jan Fine, Frequency Sleuth*

Bearcat 210/220/250/300, Radio Shack handheld and desktop units including the 2006 and 2035 with OptoElectronics Board, and currently the Uniden 235, 245 and 780. His software includes ScanStar, ScanCat Gold, Probe, Radio Manager, WinScan, E-Trunker and Trunker.

Searching for new information consumed the greatest amount of time in the early years, but it had rewards: He recalls making use of a nearby recreation complex in a condo development, where his 10<sup>th</sup> floor perch allowed 50-mile reception on a rubber duck antenna! Much time was also spent at the local FCC office, where microfiche records were studied for hours and hours...until Jan bought his own microfiche reader and a set of FCC fiche he could use at home.

Events were always interesting to Jan. They took some time to plan for, since hundreds of frequencies had to be programmed into several scanners, but the results were amazing: Presidential visits, Space Shuttle launches, Disney trips, the Super Bowl, the Orange Bowl Parade and various other events have provided an enjoyable and diversified hobby experience.

In addition to these memorable examples, Jan remembers a 48-hour, marathon session of frequency investigation in the late 1970s or early 1980s. A local government communications manager once ordered an "emitter book" from the FCC that listed every licensed transmitting device within 100 miles of downtown Miami...literally from DC to Daylight in terms of frequency range. The "book" was actually a large-format computer printout, single-spaced, contained in two binders that must have each been a foot thick.

Borrowing the book for a weekend, Jan set out to record as much information as possible before it had to be returned on Monday morning. Tape recorders and hundreds of note pads were used to recite and document the information, since this was well before personal computers were being sold. Everything from low frequency beacons to microwave beams were listed, government and private (this was also before all Federal Government channels were declared "classified" and unavailable to the public).

HF stations, all VHF and UHF business licenses, every aircraft and air traffic control channel, mobile telephones, government agencies, RADAR, TACAN and even the actual missile control frequencies from Homestead Air Force Base were listed...and Jan worked for hours to get as much as he could from this once-in-a-lifetime opportunity.

The emitter book was returned on time, but the next year was needed to transcribe all the tapes and make sense of all the scribbles. A greatly expanded frequency was the result, and many of those listed channels are still operational today.

Jan also recalls...

Hearing the first Israel - Egypt treaty negotiations on HF, with Secretary of State Cyrus Vance making last-minute changes to the wording of the document.

Monitoring the stand-down of Cold War-era U.S. Army Nike Missile batteries from sites surrounding Homestead Air Force Base. 148.635 MHz was used, callsign "Danger," for the removal and convoy of the missile trucks from Florida to Texas. The frequency had been previously found

**Table 1: Links of interest from this column:**

"Canada Calling" radio show: <http://www.canadacalling.com>  
 Ontario Radio Frequency Directory: <http://www.ontscan.com>  
 Technical and Administrative Frequency Lists: <http://spectrum.ic.gc.ca/tafl/tafindxe.html>  
 Spectrum Direct: <http://apollo.ic.gc.ca/english/main.html>  
 Ontario Unlisted Frequency Guide: <http://www.interlog.com/~mstone/frames.html>  
 Scanner Centre: <http://www.scannercentre.8m.com/canfrecq.html>  
 My Scanner Page: <http://www.myscannerpage.com/>  
 The Saskatchewan Scanner Page: <http://www.accesscomm.ca/users/scanner/index.html>  
 Alberta Scanner Frequencies: <http://members.home.net/rmillis/scanalt.html>  
 Edmonton Area Scanner Enthusiasts: <http://www.geocities.com/edmscanner/events.htm>  
 Eastern Ontario Frequency Directory: <http://home.achilles.net/~dhoisak/freq/eofl.html>  
 Canadian Frequency Allocation Chart: <http://strategis.ic.gc.ca/SSG/sf01608e.html>

**Table 2: Example of Emergency Management Shelter Communications Plan**

### **Miami-Dade County, Florida**

#### **Red Cross Training Net:**

145.5, Tuesdays 7:30 pm

#### **Simplex Net:**

147.47, Wednesdays 7:10 pm

#### **Coral Gables Net:**

146.865, Wednesdays 7:15 pm

#### **Main Net Exercises:**

147.0 primary/147.315 secondary, Wednesdays 7:30 pm

#### **Approaching Hurricane or Tornado:**

Monitor 147.0 and 147.315; 147.0 and 442.35 linked; 146.835 will be used as available

#### **Declared Emergency:**

147.0 and 442.35 for Staging

147.21 for North Miami-Dade area

147.315 and 443.225 for countywide and City of Miami area

146.835 for South Miami-Dade and Homestead area

#### **Shelters:**

145.31 and 443.375 primary

146.73 and 145.41 secondary (linked to 443.55)

#### **Miami-Dade County Employees**

443.75

#### **Emergency Operations Center**

444.475

through searching the military bands, and it was positively confirmed from a listing in the emitter book as a local "Interbattery" radio channel.

Staying up all night to search and monitor National Guard low-band channels during Miami's civil disturbances in 1980. Each Guard unit had their own frequencies, and several units were stationed around each trouble spot. We had never experienced such a community upheaval or seen this kind of response before.

Having a "new" agency to monitor in 1981, when the Mariel Boatlift brought hundreds of refugees to Miami and forced the establishment of temporary housing camps. The U.S. Park Police, from Washington, D.C., was brought in to secure the camps because local resources were spread too thin. The Park Police set up a temporary VHF-High Band repeater system for the duration of the emergency, using many of the same frequencies used in Washington, D.C.

Listening to the confusion surrounding the Pope's visit to Miami, during which the Pope's aircraft, "Vatican 1," arrived early and had to circle for several minutes until Air Force 1 landed...so the President could be in place to greet the Pope.

Sharing the frustration of county employ-

ees during 1992's Summit of the Americas conference, when the county's new EDACS system was first deployed as a separate and "secure" communication system for the conference. County employees had trouble communicating, and he had trouble listening in!

Watching and monitoring the Coast Guard's demonstration during an air show in 1996, just to see the demonstration be cancelled abruptly with the aircraft quickly departing...ValuJet 592 had just crashed in the Everglades.

Bringing scanning into the classroom, Jan has used his scanner and other radio equipment to monitor the Space Shuttle's Amateur Radio experiments and teach his students about these subjects. Back at home, his son Matt is now getting into Amateur Radio, but how does the rest of his family feel? "They just put up with it," he says with a very wide smile!

### **◆ On the Keyboard**

I'll have more of your mail items covered and continue to answer your questions and information requests. Please send your frequency lists, comments and questions to the e-mail address printed above.

## Welcome to Canada

**W**elcome to the new *Scanning Canada* column. *MT* has wanted to create a column especially for its Canadian subscribers for some time. This month marks the start of a new monthly feature dedicated to Canadians, visitors to Canada and all those radio monitoring enthusiasts who share an interest in this country and its airwaves.

Canada is comprised of ten provinces and three territories, spanning six timezones and a coastline on three oceans (Atlantic, Pacific and Arctic). Within its vast landmass, Canada offers an amazing diversity of signals to monitor.

### Local Attractions

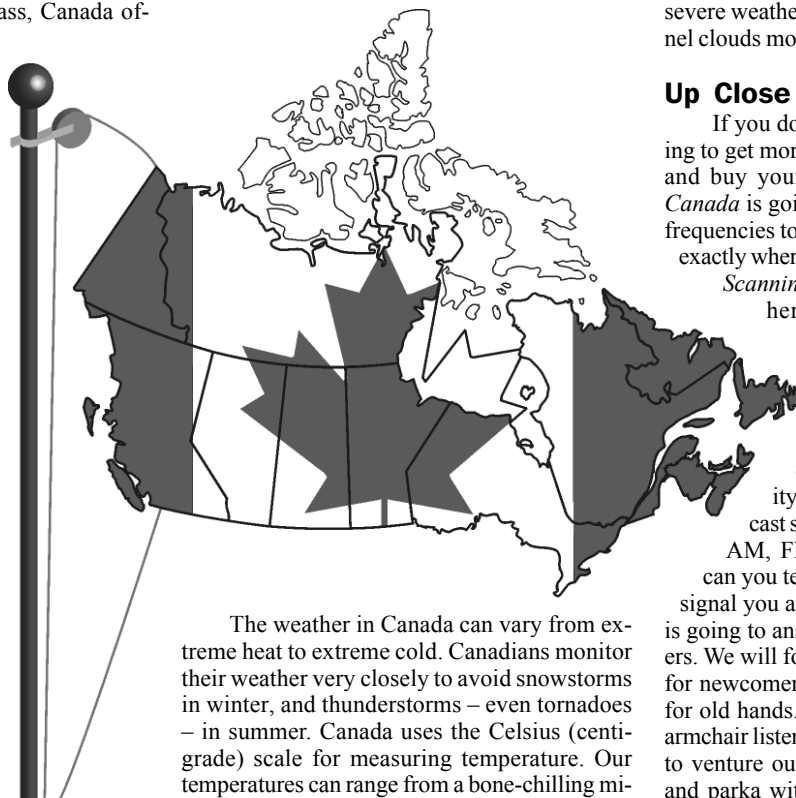
*Scanning Canada* is going to take its readers all across the nation and up into the farthest reaches of the High Arctic. We are going to travel together along the mighty railroad linking the Atlantic and Pacific oceans. We are going to venture high up into the Rocky Mountains, and we are going to witness the breathtaking rainbow mists and thundering splendor of Niagara Falls.

We will follow aircraft from the gate at Canada's largest airport in Toronto, across the apron and out onto the runways. Switching from frequency to frequency, we are going to follow aircraft through controlled airspace to their destinations.

Huge, long, slender ships called "Great Lakers" work their way through the Great Lakes and down the St Lawrence Seaway past American and Canadian inland water ports, toward the Atlantic Ocean. *Scanning Canada* will be monitoring the frequencies used to guide these magnificent vessels through narrow waterways, like the Welland Canal that bypasses Niagara Falls. We will track their progress across vast inland "seas" and through deadly storms that can sink even the biggest ships, like the famous "Edmund B. Fitzgerald" which sank in Lake Superior in 1975.

At the very heart of Canada's largest city, Toronto, stands the world's tallest free-standing structure. Soaring to a height of over 1800 feet,

the "CN Tower" is an enormous transmitter site carrying many signal sources. Visitors to the tower can peer down through a glass floor beneath their feet to the streets over a thousand feet below, or dine at the world's highest revolving restaurant. Meanwhile, even higher up the tower, a huge complex of radio transmitters is at work bringing broadcast and telecommunications signals to a wide audience and out to a network of repeaters in the surrounding countryside.



The weather in Canada can vary from extreme heat to extreme cold. Canadians monitor their weather very closely to avoid snowstorms in winter, and thunderstorms – even tornadoes – in summer. Canada uses the Celsius (centigrade) scale for measuring temperature. Our temperatures can range from a bone-chilling minus forty degrees in the Arctic winter, to a simmering plus thirty degrees in the southern summer. A federal government agency called Environment Canada maintains weather stations throughout the nation. A network of VHF radio stations (similar to those operated by NOAA in the United States) keeps Canadians up-to-date on changing weather patterns.

### Canadian Services

Canada has a very active ham radio community. Many clubs throughout the country, working through our national organization "RAC" (Radio Amateurs of Canada), keep the

hobby alive and well. Many also participate in public service activities such as ARES (Amateur Radio Emergency Service) and the Canwarn severe weather monitoring network. Canadian licensing requirements are different from those of the United States, and there are differences in the bandplans, too. Even unlicensed radio enthusiasts can share in the fun by monitoring amateur radio service repeaters. You will hear hams exchanging information about rush-hour traffic conditions, or you may even tune into a severe weather monitoring net and learn of funnel clouds moving through your area.

### Up Close and Personal

If you don't already own one, you are going to get more out of this column if you go out and buy yourself a GPS receiver. *Scanning Canada* is going to give you more than just the frequencies to monitor, we are going to tell you exactly where to go to visit the transmitter sites.

*Scanning Canada* will give you the megahertz, the latitude, longitude and maybe even the street address.

Our countryside is filled with communication towers. Some carry long-distance, or cellular, telephone traffic. Others carry pager signals, or public utility signals. Still others carry broadcast signals from local and international AM, FM and shortwave stations. How can you tell which tower is transmitting the signal you are monitoring? *Scanning Canada* is going to answer that question and many others. We will focus on practical "how-to" advice for newcomers to scanning, and advanced tips for old hands. There will be something for the armchair listener, and still more for those willing to venture out into the snow in their mukluks and parka with a scanner in their fleece-lined pocket.

For my fellow Canadians, *Scanning Canada* is your column. We are going to be a forum for sharing information on the scanning hobby in Canada. Our focus will be on frequencies, more frequencies, scanning tips and tricks, signal source locations, and how to track them down. If you have something to share, send it to me at [johndavidcorby@yahoo.com](mailto:johndavidcorby@yahoo.com). All contributions will be acknowledged with a personalized response, and the best will be published here in *MT*.

All this will be served up with a distinctly "Canuck" flavor. Let's break squelch north of the border and scan Canada, eh?



## The Middle East: More Voices from the Sky

**A**l Wires writes from Georgia with a detailed log of some very strange transmissions. He assures me that none of it is "bogus." I assure him that it most certainly is not, and that in fact he's hit on just another daily weirdness in the bizarre world of "numbers."

The first transmission is described as "not sideband." I suspect it was reduced-carrier upper-sideband, a mode called R3E by the international bodies who name such things. It was in English, on 11565 kilohertz (kHz), at 0100 Coordinated Universal Time (UTC). The woman's machine voice seemed stuck in a loop, repeating "Echo, Zulu, India, Two," for 3 minutes and then going away.

Now, you numbers fans already know who this is, but please play along. The "lady" was back at 0200, a bit higher on 11566, with a weaker, narrower (straight upper sideband/USB?), and less intelligible signal. Was there a transmitter change? Sure sounds like it.

Again, the Echo, Zulu, India was repeated, without the number two, and this time there was a message. It began with repetition of "Group A," then a 5-letter-group sequence until "End of message" was given at 0216. At 0230, the whole thing was repeated until 0253. Then, finally, at 0300, the "Echo, Zulu, India" callup was repeated forty times.

At this point, Al packed it in, but the station was still going strong. He also notes that the voice always seemed to say the "N" phonetic as "Novembair," as if with a French accent. This was all just too strange.

### ◆ Who It Is

OK, now we can all answer. This weird transmission, sometimes known as the Phonetic Alphabet Station, almost certainly comes from an Israeli intelligence agency, though nobody's quite sure which one. Prime suspect, of course, is the famous Mossad, one of the world's major players in international espionage and counter-terrorism.

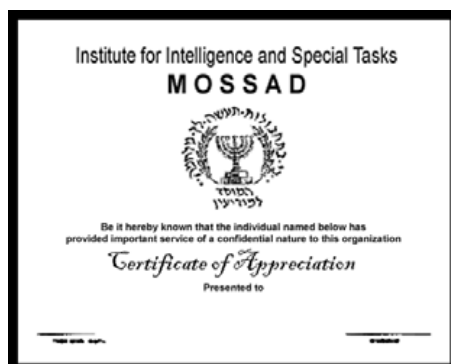
Mossad (from "Institute" in Hebrew) is a large agency, with many departments, but it's hardly the only one in this troubled region. Two other Israeli possibilities are Shin Bet, a domestic intelligence and counter-terrorist group, or Aman, the military intelligence service.

Transmitter locations are no easier to pin down. Travelers have noted very high signal strengths in Israel, but others have made good cases for relays in Cyprus and/or South Africa. Odd frequencies heard by Dr. Takashi Yamaguchi in Japan suggest that other relay points might exist.

### ◆ Why It Is

Though this station codes its messages into phonetic letters, it's still a classic numbers broadcast. Like most of these, it is powerful, easy to find, and impossible to understand. Generations have come and gone since the first numbers were noted around the beginning of the Cold War. Maddeningly, there's still very little hard information on what the whole thing is about.

What we do have seems to point toward international intelligence. Several ex-spies have talked about receiving instructions by shortwave and decoding messages with tiny "one-time pads" or other devices. Such instructions, if they exist,



would most likely be pretty routine stuff. As we've seen from testimony in recent spy cases, espionage at this level is a very dull business.

Getting back to Al's Israeli network, though, the "numbers" community has given it a typically terse name. It's "E10," from its position on the English-language portion of a list maintained by ENIGMA, the European Numbers Intelligence Gathering and Monitoring Association. Along with the various Cuban transmissions, and the British "Lincolnshire Poacher," E10 is the most widely logged "numbers" station in the world.

### ◆ How It Works

E10 is kind of a strange beast. Unlike most numbers stations, which run hours of dummy messages to defy traffic analysis, this one has high, medium, and null traffic groups. The high and medium groups follow a daily schedule. The null stations follow no known schedule, and always stop after the three-letter identifier loops. They often appear when something's up in the Middle East.

The initial identifiers can repeat many more times than Al's forty. This call-up usually lasts three or four minutes, but sometimes it drones away for hours. Nobody knows why. Nor is it known why they, or their equipment manufacturer, recorded a woman with a French accent. But one thing is for sure. If you hear "Novembair," like Al did, it's E10. That's a dead giveaway every time.

Commonly heard identifiers, alphabetically, are ABC, ART, CIO, EZI, FDU, FTJ, JSR, KPA, MIW, PCD, RCH, SYN, TMS, ULX, VLB, and YHF. Nobody knows if these three-letter calls identify the group being called or the station calling. The occasional use of longer, abnormal identifiers might provide a clue. These start with the same three letters but include many more characters. It's been proposed that the basic three-letter call-up represents an entire area, while the longer ones are specific groups or even individual agents.

"Group A" is a bit strange. This part of the message used to be a numeric group count, presumably for checking, but lately letters have shown up as well.

Another odd thing is E10's use of the number 2 at the end of the identifier when there's no message and the transmission is going to end. In other words, the repeating EZI would mean "message follows; keep listening," while EZI2 would be "you're through tonight; carry on." ENIGMA has given these "2" variants the code of "E10a." Sometimes there's a number 1 instead, which some people think might mean a test transmission.

World Wide Web users can find a much more detailed analysis of E10 at <http://www.simonmason.karoo.net/page69.html>. Good hunting!

### E10 Frequencies

Transmissions start hour, h+15, h+30, h+45 AM or Reduced Carrier USB

3840	4130	4270	4360	4460	4560	4665
4720	4780	4880	5091	5170	5230	5339
5435	5530	5629	5901	6270	6370	6498
6658	6745	6840	6912	7445	7540	7760
7811	7920	8127	9130	9160	9270	9382
10648	10820	10970	11565	12747	13533	
13921	14750	14866	15050	15355	15983	
16048	17966	18176	19715	20740	21930	

## Abbreviations used in this column

AFB	Air Force Base
ALE	Automatic Link Establishment
ARIA	Advanced Range Instrumentation Aircraft
ARQ	Automatic Repeat Request teleprinting system
CW	Continuous Wave (Morse telegraphy)
EAM	Emergency Action Message
E10	English phonetic alphabet "numbers," Israel
FAX	Radiofacsimile
FEC	Forward Error Correction teleprinting system
FGS	Federal German Ship
FS	French Ship
MARS	Military Affiliate Radio System
Meteo	Meteorological (weather office)
MFA	Ministry of Foreign Affairs
MFSK	Multiple Frequency Shift Keying
NATO	North Atlantic Treaty Organization
NAVTEX	Navigational Telex
PACTOR	Packet Teleprinting Over Radio
RSA	Republic of South Africa
RTTY	Radio Teletype
SITOR-A	Simplex Telex Over Radio, ARQ mode
SITOR-B	Simplex Telex Over Radio, FEC mode
UK	United Kingdom
Unid	Unidentified
US	United States
USNS	US Naval Ship
V2/V2a	Cuban numbers, 3 messages, begins "Atencion"
VFT	Voice Frequency Telegraphy
VOLMET	Flying Weather (loosely from French)
XPH	High Pitched Polytone, Russian tonal numbers

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Universal Time). "Numbers" stations (encrypted, usually unidentified, broadcasts thought to be intelligence-related) are identified in () with their ENIGMA station designators, as issued by the European Numbers Intelligence Gathering and Monitoring Association.

38.0	SHR-Swedish Navy, Ruda, with encrypted CW traffic at 1430. (Day Watson-UK)
61.8	Unid-Continuous marker in slow, narrow-shift RTTY, at 2154. (Watson-UK)
68.9	DHO 38-German Navy, Glucksburg, with fleet broadcasts and support to submarines in exercise BALTOPS, in RTTY at 0800 and 1200. (Watson-UK)
490.0	"U"-Cullercoats Radio, UK, with weather in SITOR-B, at 0720. "C," Portpatrick Radio, UK, similar at 0825. "E," Corsen Radio, France, with SITOR-B weather and navigation warnings in French, at 0840. (Watson-UK)
518.0	"K"-Kerkyra, with NAVTEX in SITOR-B at 0140. Also "Q," Split, at 0240; "T," Oostende, at 0710, "W," Valentia, at 1940, and "U," Trieste, at 2320. (Watson-UK)
2656.0	Unid-Male Italian-speaking voice, sending single-figure groups and an occasional "quarante due," ending at 2252. (Geoff Halligey-UK)
3264.4	SAB-Globe Wireless node, Goteborg, Sweden, with markers and then working a ship on 3159.5, in GlobeData mode at 1900. (Watson-UK)
3264.5	SAB-Same Globe station in Sweden, with SITOR and GlobeData markers at 2320. (Halligey-UK)
4744.5	"B-9-H"-Unknown NATO trigraph identifier, working "J-W-T," at 2117. (Johan Boerman-Netherlands)
5206.0	Control-Unknown military, possibly Dutch, working KA, KE, and KL, at 0900. (Boerman-Netherlands)
5295.0	Unid-Probably US military, in a net with many single-letter call signs and numbered data items, at 1000. (Harry Riddell-NY) Does sound like target tracking. -Hugh
5399.6	GANTSEC-US Coast Guard Greater Antilles Section, PR, working an unid aircraft at 0049. (Ron Perron-MD)

5680.0	"1-Z-S"-US military with EAM, interference from an unrelated broadcast jammer, at 0350. (Jeff Haverlah-TX)
5696.0	Coast Guard Rescue 6031-US Coast Guard aircraft reporting enroute to a hospital in NC, with 5 persons on board, at 0125. (Perron-MD)
5841.0	Panther-US Drug Enforcement Agency, Nassau, Bahamas, working Coast Guard 60A and Coast Guard 38C, in a long pursuit of a go-fast boat at 0110. (Perron-MD)
5932.0	ETD3-Addis Ababa Air, Ethiopia, with RTTY markers, then working Djibouti at 2143. (Watson-UK)
6694.0	Canadian Warship C5R-Canadian Forces, in radio check with Halifax Military at 0045. (Perron-MD)
6697.0	High Tide-Possible callword of a weak US military station, with a coded message simulcast on 11244, then gone, at 0318. (Haverlah-TX)
6712.0	Lajes-US Air Force Global High Frequency System, Lajes Air Field, Azores, testing with White Ash at 0049. Lajes with an EAM at 0150. (Perron-MD)
6730.0	DHJ 59-German Navy, working "U-6-R," at 0745. (Boerman-Netherlands)
6757.0	Lady Luck-US military ground station, working Hip Bone, came from 9016 to find a data signal on-channel, operator went "back to 150" (Zulu-150, 5800 kHz), at 0517. (Haverlah-TX)
6779.0	DHJ 59-German Navy, working unid vessel at 0022. (Perron-MD)
7918.0	Unid-English speaking female with "Group 30," the a long series of NATO military phonetics, at 0135. (Perron-MD) Sounds like Israeli intelligence (E10). -Hugh
7919.0	Texaco 01-US Air Force tanker in a patch via Metaphor to Mindenhall Command Post, at 0906. Air Evac 764, in a radio check with Metaphor, also at 0906. (Boerman-Netherlands)
8335.5	DHJ 59-German Navy, Wilhelmshaven, working vessel DRAY (FGS Karlsruhe) in voice and RTTY, at 0145. (Perron-MD)
8500.0	VTH1/5/7-Indian Navy, Bombay, with RTTY markers, then calling VFTS, at 1557. (Bob Hall-RSA)
8541.0	A9M-Globe Wireless node, Bahrain with markers, then working a ship in GlobeData mode, at 1944. (Watson-UK)
8549.0	UCE-Arkhangelsk Radio, Russia, with letters "ky" plus SITOR-A idle bursts, at 1951. (Watson-UK)
8625.3	GYU-British Royal Navy, Gibraltar, channel 2 of a USB VFT fleet broadcast, in RTTY at 1853. (Watson-UK)
8625.9	GYU-British Royal Navy, Gibraltar, channel 1 of the VFT, with RTTY channel bulletins at 1856. (Watson-UK)
8640.3	GYA-British Royal Navy, London, with RTTY, part of a 4-channel VFT fleet broadcast, at 1947. (Watson-UK)
8642.1	GYA- British Royal Navy, London, with RTTY in channel 3 of the VFT, at 1950. (Watson-UK)
8834.0	008-Aeronautical Radio, Incorporated, Johannesburg, RSA, with High-Frequency Data Link system, at 1839. (Watson-UK)
8971.0	Blue Star-US Navy, Roosevelt Roads, Puerto Rico, working Waffer 714 at 0322. (Perron-MD) 15WF-Unknown US military in clear and secure voice checks with Golden Hawk (US Navy, Brunswick, ME), at 2145. (Boerman-Netherlands)
8974.0	Air Force Townsville-Royal Australian Air Force, working unknown station at 1059. (Riddell-NY)
9016.0	Lady Luck-US military, checking into a net controlled by Hip Bone, after which they changed frequency to 2165 (6757), at 0516. (Haverlah-TX)
9041.0	5YE-Nairobi Meteo, Kenya, with weather in RTTY at 1840. (Watson-UK)
9048.0	5YE Nairobi Meteo, Kenya, with weather in RTTY, inverted from 9041 and obviously a spurious emission, at 1844. (Watson-UK)
10204.0	Remedial-US military, with EAM simulcast on 8992 and 11244, at 1448 and 1456. (Haverlah-TX)
10722.0	DRHM-German Navy vessel FGS Werra, working DHJ 59 in voice & RTTY, at 0019. (Perron-MD)
11076.0	Panther- US Drug Enforcement Agency, working Coast Guard 51A on what he called the "Echo" frequency, at 0330. (Perron-MD)
11175.0	Dark 93-Unknown US, calling "Any MARS station" with no joy,

- gave position as "south of Lake Michigan" at 0203. USNS Loyal-US Navy ocean surveillance ship, calling "Any Global station," no joy, at 0216. (Haverlah-TX) Reach 314-US Air Mobility Command, declaring an in-flight emergency (bad #3 engine) in a patch via Andrews AFB (MD) to Ramstein, then Croughton, starting at 0750. (Boerman-Netherlands)
- 11202.0 CAMSPAC Point Reyes-US Coast Guard Communications Area Master Station, Pacific, in a long conversation with a small vessel regarding a medical emergency on board, at 1100. (Riddell-NY)
- 11205.0 Architect-British Royal Air Force, Flight Watch Centre, passing airfield "color" weather and operational states at 0330. (Perron-MD)
- 11217.0 DHM 91-German Air Force Transport Command, Muenster, working German Navy 4742, an aircraft also in the Niagara Falls (NY) Air Show, at 0100. (Perron-MD)
- 11232.0 Trenton Military-Canadian Forces, working Canforce 2705 (unheard), went to 17994 kHz, at 2217. (Perron-MD)
- 11244.0 Unintelligible-US military, with an EAM, simulcast on 8992, lots of background conversation, at 0715. Unid-CW station, trying to send with a speed key set too fast, at 1308. (Haverlah-TX)
- 11253.0 British Royal Air Force, West Drayton, with VOLMET at 0306. (Perron-MD)
- 11297.0 Unid-Russian language VOLMET with a female voice, probably Rostov, at 0259 and 0325. (Perron-MD)
- 11436.0 KXPL-Unknown station calling "3YM4" in CW, then steady carrier, at 0906. (Watson-UK) Unid-Probably US Coast Guard, New Orleans, LA, in a series of tests which included a Tropical Prediction Center FAX at 1220, a voice weather relay from CAMSLANT Chesapeake at 2230, and a long SITOR-B weather and information bulletin transmission at 2300. Station has not been on since. Most of the time this frequency is heavily encrypted RTTY. (Hugh Stegman-CA)
- 11461.7 RFVIPPB-French military, Reunion, St. Denis, with ARQ exercise traffic in French for RFVIFLR (French Ship *Floreal*), RFVIGRN (FS *Garonne*), RFVIPP (Air Command), RFVILGD (FS *La Grandiere*), RFVITT (French military, Mayotte), and RFFIPPA (Air Force), giving full simulated operations orders on the "IMB" circuit, at 1140. (Hall-RSA)
- 12180.0 Unid-Spanish female "numbers" voice, in progress at 0215. (Perron-MD) *Probably the Cuban "Atencion!" (V2 or V2a) - Hugh*
- 12745.5 JJC-Tokyo Radio, Japan, with a Japanese newspaper FAX (60/576), good copy, at 1605. (Hall-RSA)
- 12808.5 KPH-Restored RCA coastal station at Pt. Reyes, CA, CW markers from a vintage "L" transmitter, testing for a second special event operation from the old station with Globe Wireless permission on the callsign, at 2326. (Stegman-CA)
- 13155.0 Unid-US military, with 3 EAMs at 0344. Unid-US military, with digital poll/response signals, weak scrambled voices, and 39-tone digital data modems, at 1937. Snow Flake-US military, with EAM simulcast on 11244, at 2253. (Haverlah-TX) *This is an old US Navy output, on half of maritime duplex channel 1227. Looks like it came under US Strategic Command. -Hugh*
- 13245.0 Geranium-US military, with a 21 character EAM, simulcast on 8992, at 1702. (Haverlah-TX)
- 13348.0 Cedar Rapids Radio-Aircraft operational station, patching AmTrans (American Trans Air) 672 to Maintenance Ops for several write-ups of mechanical problems, at 0301. (Perron-MD)
- 13510.0 CFH-Canadian Forces, Halifax, NS, with a satellite picture FAX, which became stuck near the end repeating the same scan line, at 1027. (Watson-UK)
- 13510.1 CFH-Canadian Forces, Halifax, with weather reports in RTTY, at 1850. (Watson-UK)
- 13530.0 Unid-US Air Force Automated Weather Network, with RTTY weather observations from "KAWN," at 1909. (Watson-UK)
- 13900.0 BMF-Taipei Meteo, Taiwan, with blurry FAX of a Chinese fisheries forecast, at 2125, then a weather chart at 2135. (Watson-UK)
- 14373.0 MNRV-Monrovia, Liberia, with 200-baud PACTOR traffic in Spanish to an unknown station, at 1725. (Hall-RSA)
- 14481.7 RFTJ-French Navy, Dakar, Senegal, with ARQ news and sports in French, at 0940. (Hall-RSA)
- 15633.4 HMF26-Korean Central News Agency, Pyongyang, North Korea, with RTTY news in English, at 1650. (Hall-RSA)
- 15794.0 Unid-British Military, Cyprus, with encrypted MFSK traffic at 1732. (Hall-RSA)
- 15851.0 FAAZLA-US Federal Aviation Administration, Los Angeles Center (transmitter probably nearer San Diego), sounding in ALE at 0526. FAAZOB, unknown location, sounding at 0608. FAAZMP, Minneapolis, MN, sounding at 1854. (Stegman-CA)
- 16256.7 Unid-Egyptian diplomatic SITOR-A, with operator chat in Arabic, at 1550. (Watson-UK)
- 16316.0 Unid-Polish Embassy, Kinshasa, with ARQ identifiers, no traffic, at 0814. (Hall-RSA)
- 16412.7 Unid-Financial traffic in French, from Kinshasa, in 100-baud PACTOR at 0916. (Hall-RSA)
- 16631.7 dlkgmk-Egyptian Embassy, Luanda, Angola, with ARQ traffic in Arabic for Cairo MFA, at 1526. (Hall-RSA)
- 16985.7 CTP-NATO, Lisbon, Portugal, with markers in RTTY, at 1605. (Hall-RSA)
- 17165.6 CLA 41-Habana Radio, Cuba, CW marker, at 2007. (Maltz-NY)
- 17175.0 A9M-Hamala Radio, Bahrain, CW marker, at 2005. (Maltz-NY)
- 17180.3 FUG-French Navy, La Regine, France, RTTY marker, at 2025. (Maltz-NY)
- 17206.1 IAR-Rome Radio, Italy, with a calling all stations marker in CW, at 1956. (Ken Maltz-NY)
- 17384.5 Unid-Polytone station, Russia (XPH), with weird multitone codes, at 1940. (Maltz-NY)
- 17414.0 P6Z-French MFA, Paris, with a FEC message in French to H6L, Algiers, at 1520. RFGW-French MFA, Paris, with FEC messages in French to RFFVCF (French military, Paris), and RFFVICF (French military, Villacoublay), concerning a special international flight, at 1537. (Hall-RSA)
- 18190.5 Unid-US Coast Guard e-mail system set up by Navy-Marine Corps MARS, beaconing in 100-baud PACTOR with callsigns of ships having mail, at 1838. (Stegman-CA)
- 19696.5 8PO-Bridgetown Radio, Barbados, SITOR-A marker, at 1910. (Maltz-NY)
- 21974.0 TAD-Turkish MFA, Ankara, with FEC news in Turkish, at 1238. (Hall-RSA)
- 22380.0 UIW-Kaliningrad Radio, Russia, SITOR-A marker at 1704. (Maltz-NY)
- 22387.5 SVO-Athens Radio, Greece, CW marker at 1700. (Maltz-NY)
- 22951.0 HBD20-Swiss MFA, Bern, with coded ARQ traffic in 5-letter groups to Nairobi, Nicosia, Pyongyang, Rabat, Teheran, Tunis & Dakar, at 0906. (Hall-RSA)
- 23370.0 HZN 50-Jeddah Meteo, Saudi Arabia, with coded RTTY weather observations at 1225. (Hall-RSA)
- 23522.9 JMH6-Tokyo Meteo, Japan, with a clear weather chart FAX at 1228. (Hall-RSA)
- 24711.7 RFTJ-French military, Dakar, Senegal, with ARQ on the "AFL" circuit at 0955. RFTJT-French Navy, West Africa, with ARQ for RFFIM (FN Paris) and RFFUHS (French Air Force), AFL circuit at 1200. RFTJCF-French Navy vessel, with coded ARQ 5-letter groups for RFFMVL, Toulouse Meteo, at 1255. Provence-French Military, with ARQ on the AFL circuit, at 1905. (Hall-RSA)
- 26132.0 ZSC-Capetown Radio, RSA, with SITOR-A markers on what may be a new frequency, at 1530. (Maltz-NY)
- 26441.7 RFFAB-French military, Paris, with long message in 5-letter code groups, at 1022 and 1105. RFVI-French military, Le Port, with traffic on the "IRE" circuit, at 1735. (Hall-RSA)



## Diplomatic Organization on the Move

**T**his month we cover the Czech Diplomatic Service, the latest organization apparently making a transition to more modern equipment, find a new HF email service, and detail the Clover system.

### ◆ Czech Diplomatic Service

Often known by its distinctive ITU callsign OLZ88, MFA Prague has been a busy occupant of HF for many years. Around five years ago, operation switched from largely 75bd or 100bd 500Hz shift Baudot-based transmissions to a new FSK ARQ modem, sending primarily binary ASCII data. The system became known as ASCII-ARQ (or IRA-ARQ) and has been the mainstay of the Czech operation since.

In June 2001, however, it appears that after having experimenting with modified MIL-188-110A gear, both the MFA and a number of embassies, most notably Cairo, have been heard using the Clover-2000 modem triggered by the usual MIL-188-141A ALE. As is the case with many of the established HF operations, ALE identifiers follow the callsigns used by stations using the old system.

MFA Prague and its embassies have been spotted on the following frequencies:

12219	12310	13398	13812	13890	14359
14362	14364	14385	14388.4	14390	14395
14400	14401	14446	14478	14480	14650
14652	14778	14812	14892	15812	15905
15969.5	16100	16178	16180	16188	16270
16272	16298.5	16300	16308	16315.5	16357
16358	16370	16370.5	16395	17414	17500
18030	18297.5	18319	18323	18325	18375
18400	18401	18420	18462	18480	18482.9
18629	18668.2	18918	19317	19330	19394
19457	19458	19465	19673	19847	20614
20615	20617	20653	20682.5	20795	20800
20804	20852	20892	20900	20902	20905
21810	22800	22820	22852.5	22856.5	22888
23898	25498	26748			

The majority of Czech outposts use fictitious callsigns, as can be seen from the following table:

Tactical Call	Location	Tactical Call	Location
1R7	Nairobi	ETN40	Addis Ababa
1S7	Paris	ETT90	Addis Ababa
1X7	Athens	KNY23	Washington
2B6	Addis Ababa	OLZ88	MFA Prague
2C6	OLZ69 Cairo	OLZ73	Rome
2D6	Teheran	OLZ87	Tunis or Tripoli
2F6	Pyeongyang	3Q5	Ankara
3G5	Algiers	3R5	Belgrade
3K5	OLZ75 Beirut	5F3	Bucharest
3L5	Hanoi	5Q3	Conakry

Stations can be seen sending both plain text messages and off-line encrypted traffic. For more detailed information see the Resources section.

### ◆ Two More HF Email Services

While scanning the frequencies between 10 and 11 MHz, a favorite place for evening digital utility listening during the summer, we came across a new unidentified PacTOR signal on 10523 kHz. A quick check of a few resources, including the very useful FCC database, revealed that this belonged to an HF email service operated by Seven Seas Cruising Association, registered as KGA528 with transmitter in Nashville, Tennessee. Frequencies are as follows: 4805, 4807, 7822, 10523, 13936, 13937, 18234, 21862, 21866

The organization appears to have many similarities with the established SailMail Association, operating as an easy to use, cheap provider of email to mariners.

Another popular HF email service is "CruiseEmail" which operates globally through the following stations and frequencies:

#### WGM Hollywood, FL

4439.5, 4625.5, 5017.0, 5023.5, 7327.5, 8055.5, 9360.0, 12185.0, 12197.0, 13585.0, 13865.0, 18172.0, 18910.0, 22876.0, 22888.0, 24575.5, 24615.0

#### WHX Annapolis, MD

2127.0, 2124.0, 2248.0, 4464.0, 4503.0, 4641.0, 5058.3, 5330.0, 6771.0, 6858.5, 6932.5, 8050.5, 8085.0, 8072.5, 9185.0, 9204.5, 12130.0, 12194.0, 12894.0, 14888.0, 14936.0, 14942.0, 16190.0, 16258.0, 16580.0, 18573.0, 18763.0, 22275.0, 22890.0, 22588.0, 24590.0, 24682.0, 24764.0

#### WLC Roger City, MI (on test)

2196.9, 4212.0, 6316.0, 8418.0

#### ZMH302 Auckland, New Zealand (operated by Xaxero)

A further station located in Seattle will probably be operational by the time you read this column. You can get details on more HF Email services by checking the Resources section.

### ◆ System Profile: Clover

Like many other successful commercial systems, Clover was originally developed by a radio amateur and is now marketed by HAL Communications. It sounds like a burbling "canary" when transmitting. The signal consists of a burst of ones plus a long twenties data transmission.

Clover's key characteristics are bandwidth efficiency with high error-corrected data rates. Clover adapts to prevailing conditions by constantly monitoring the received signal. Based on this monitoring, Clover determines the best modulation scheme to use and thereby maximum data throughput:

Format	Baud rate
BPSM	4 pulse binary phase 125 bps
QPSM	4 pulse quad phase 250 bps
8PSM	4 pulse 8 phase 375 bps
16PSM	4 pulse 16 phase 500 bps
8P2A	4 pulse 8 phase 2 amplitude 500 bps
16P4A	4 pulse 16 phase 4 amplitude 750 bps

The signal occupies a total bandwidth for all modes of 500 Hz.

Clover-2000 is a newer commercial form of CLOVER developed by HAL Communications, now in operation with a number of diplomatic, aid and military organizations. It quadruples the speed of standard CLOVER and uses a bandwidth of 2kHz. The 8 tones that make up this signal are spaced 250 Hz and are both phase and amplitude modulated. Maximum bit rate is 3000bps.

Data packets are long, about 4s in duration, and have the same "canary" sound as with the previous system. Idle chirps are short, about .3s in duration with about .8s between chirps.

Unfortunately, and probably due to licensing constraints, there is no decoder available for any Clover variant, except for those produced by HAL Communications.

Please note a new address for Utility Monitoring Central, and don't forget to change those bookmarks. Until next time, good binary DX.

### Resources

Utility Monitoring Central	<a href="http://www.chace-ortiz.org/umc/">http://www.chace-ortiz.org/umc/</a>
Czech Diplomatic Service	<a href="http://www.chace-ortiz.org/umc/mfatext/Czech.txt">http://www.chace-ortiz.org/umc/mfatext/Czech.txt</a>
FCC Database	<a href="http://www.fcc.gov/">http://www.fcc.gov/</a>
Singapore Navy	<a href="http://www.mindef.gov.sg/navy/">http://www.mindef.gov.sg/navy/</a>
Seven Seas Cruising Ass'n	<a href="http://www.ssca.org">http://www.ssca.org</a>
Cruise Email	<a href="http://www.cruiseemail.com">http://www.cruiseemail.com</a>
UMC's HF Email Section	<a href="http://www.chace-ortiz.org/hfemail">http://www.chace-ortiz.org/hfemail</a>
Clover-I Clip	<a href="http://rover.vistecprivat.de/~signals/WAV/CLOVER_HAM.WAV">http://rover.vistecprivat.de/~signals/WAV/CLOVER_HAM.WAV</a>
Clover-2000 Clip	<a href="http://rover.vistecprivat.de/~signals/WAV/CLOVER-2000.WAV">http://rover.vistecprivat.de/~signals/WAV/CLOVER-2000.WAV</a>

## Radio Austria International Endangered

Roland Machatschke, Managing Director of R. Österreich International, offered his support to the RCI Action Committee, for his own station has suffered drastic cuts, with the final blow possible early next year.

The future of ROI: the government will end its grant this year. Financing Radio Austria International will be passed to ORF. ORF will have no obligation of operating Radio Austria International. Should ORF decide there is not enough money for international broadcasting, it can shut down ROI at its discretion. Isn't it strange that two affluent nations like Canada and Austria try to convey the impression that they cannot afford the small expense of an international radio program? (via Ricky Leong; his full statement is on the ROI website <http://roi.orf.at/>)

### Peace Radio Website

Dr. Hansjörg Biener has established a site to gather info about stations which have promoted peace in troubled areas. For decades, the DX community has known the phenomenon of clandestine broadcasting and has developed excellent reference tools about this part of the broadcasting scene. In the recent decade, even a wider public took notice of hate radio. In order to redirect the focus of attention on the peace-making potential, the Peace Education Standing Commission of the World Conference of Religions for Peace establishes [http://](http://www.evrel.ewf.uni-erlangen.de/pesc/PESC-peaceradio.html)

[www.evrel.ewf.uni-erlangen.de/pesc/PESC-peaceradio.html](http://www.evrel.ewf.uni-erlangen.de/pesc/PESC-peaceradio.html) initially covering these African stations:

Angola: Radio Eclésia  
Central African Republic: Radio Minurca (1998-2000), Radio Ndeke Luka (2000-)  
Liberia: Star Radio (1997-2000)  
Rwanda: Radio Agatashya (1994-1996)  
Sierra Leone: Radio UNAMSIL (2000- UN), including a current programme schedule supplied by the station  
Somalia: Radio Rajo (1992-1993), Radio Manta (1993-1994), Voice of Peace (1993-)  
Sudan: Voice of Hope (2000-)  
Zimbabwe: Voice of the People (2000-)

Additional information on these and other stations is urgently sought. To be named on the peace radio site a station or program has to meet the following criteria:

- adherence to journalistic principles in its reporting
- humanitarian programming
- financial support from renowned international sources

This excludes partisan and clandestine broadcasting as well as much of the programming sponsored by single religious groups. It also excludes some government sponsored broadcasting which did or might have effects for international peace, democracy and human rights.

**ARGENTINA** Contrary to last month's report, decided not to change timezone, staying on UT -3 (Nicolás Éramo, Argentina, Conexión Digital)

**AUSTRALIA** A list of Royal Flying Doctor Service frequencies includes some which could clash, or have clashed with broadcasters:

VJD	ALICE SPRINGS	6950
VJN	CAIRNS	7465
VJJ	CHARLEVILLE	4980
VKJ	MEEKATHARRA	6880
VJI	MOUNT ISA	6965
VKL	PORT HEDLAND	6980

(via Australian DX News) To avoid hecklers, United Patriot Radio, whose closedown mentioned last month was short-lived, moved from 6900 to 6880, which is also a USN/MARS frequency (via Tom Severt, rec.radio.shortwave via John Norfolk)

**BOLIVIA** R. Pio Doce, Siglo Veinte, 5952.4 with potent signal, interviews, discussions, announcements moving seamlessly between Spanish and Quechua? (Graham Bell, Offord, Kent, England, DX Listening Digest)

An unID varying around 3343.7 was widely reported: 3343.69, Radio Cuarto Centenario, 1033-1040 in Quechua (Nicolás Éramo, Argentina) Used to be a Radio Cuarto Centenario in Tupiza, Bolivia. Last listed in the WRTH in 1992 on 5020.1 (Don Moore) 3343.77 at 2325 UT unID, probably Perú, at least Andean (Jan Edh, Sweden, SW Bulletin). Also here in Quito on 3343.72v, starts up between 10-1030 and closes at 0100-0130 UT, weak modulation and dull audio (Björn Malm, Ecuador, SW Bulletin) Not completely IDed, but is in Cochabamba Department, Bolivia (Rogildo Fontenelle Aragão, Cumbre DX)

**BRAZIL** 6050, a mystery at 0655, over 40 minutes of non-stop English oldies pops at a reasonable level, replay of an American music show as all announcements were in English, related only to artists and songs. Then at 0730, IDs confirmed it was R Guarani (Paul Ormandy, New Zealand, DXLD)

**BULGARIA** Due to technical problems with one of the two 500 kW transmitters in Plovdiv, as of July 1st until October 28, R. Bulgaria uses only one frequency for many of its broadcasts, including English (with kW, azimuths):

1100-1200	WEu	17500 250/292
1900-2000	WEu	11900 500/306
2100-2200	WEu	11900 500/306
2300-2400	NAm	11700 500/306
0200-0300	NAm	11700 500/306

(Observer, Bulgaria)

Received in only 4 days QSL card from Eurosonor Radio for my report via e-mail on 9980 with 50 kW: Waldstrasse 30, D-63065 Offenbach, Germany; radio@eurosonor.de (Stefano Valianti, Italy, DXLD) Presumed site

**BURKINA FASO** Had been off shortwave since last year. My contacts in the region confirm

*All times UTC; All frequencies kHz; \* before hr = sign on, \* after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; A-01=summer season; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated*

daytime frequency 7230 active again, switching to 4815 evening (Chris Greenway, UK, World Of Radio) 4815, R. Dif. TV Burkina, Ouagadougou. Nice to hear this reactivated frequency \*0600 in French at fair level via longpath (John Schache and Craig Seager, NSW, ADXN)

**CAMBODIA** [non] Reply from Voice of Justice (clandestine), 15455, from Ms. Tioulong Saumura gave background: We are a political party fighting for democracy, human rights and justice in Cambodia. Our present leaders are former Khmer Rouge who rule the country in a dictatorial way. We do not have access to radio or TV; we have to broadcast our party's political program from abroad on SW. v/s: Tioulong Saumura, Member of Parliament of the Kingdom of Cambodia. E-mail: samrainsy@bigpond.com.kh (SRP Cabinet) (Masato Ishii, Japan, DX-Window via BC-DX) Has anyone heard this lately?

**CANADA** See NETHERLANDS for RN's added morning relays. Then RCI added its own programming or NHK relays to abandoned BBC frequencies 9515, 9590 and 6175, perhaps to keep them occupied (Ricky Leong, DXLD)

RCI Action Committee's response to Minister Coppins: "Will you protect us, or will you leave us in tatters?": <http://www.geocities.com/rciaction/ActionToCops010711.html> (Wojtek Gwiazda)

RCI transmitters putting out spurs and mixing products; from \*0030 15170 bleeding over hundreds of kHz, up and down, heard from below 15000, and as high as 15570. I doubt anyone at RCI is even aware of it. At 2346, 13670 must be same transmitter, bleeding all over the 21 mb (David Hodgson, TN, harmonics yahoo group and DXLD) DW 17875 at 1400, probably via Sackville, also making noise all over the band, modulation and splash from 17600 to 18190 with readable spurs on 17680, 17740, 17800, 17855, 17900, 17925, 17975, 18025, 18050, 18075 and 18100 to 18187 where a full sized spur sat with carrier & modulation (Bud Perkins, KA2HPU, DXLD)

Pop music announced in English, turned out to be R. Sweden heard on 3210 until 0345\* UT June 25; evidently a Sackville mixing product with DW which closes at 0345? (George Thurman, IL, DXLD) Sackville relay of Sweden at 0300-0400 is on 11895; and 15105, a DW English frequency at 0300-0345, works out nicely as 15105 minus 11895 equals 3210! Trouble is, current A-01 schedules showed 15105 via Bonaire, not Sackville, so I asked Andy Sennitt (gh) I can confirm that 15105 DW should not be listed as from Bonaire. There are no longer any DW relays via Bonaire. So the mixing product theory appears sound (Andy Sennitt, RN)

**CHINA** Voice of Pujiang. Media Provider: Shanghai People's Broadcasting Station, for listeners in Taiwan, inaugurated 1 January 1988. Aims include promoting patriotism and reunification. ID in Standard Chinese: "Pu-Jiang Zhi Sheng Guang-Bo Dian-Tai" ("Voice of Pujiang Broadcasting Station"). Alternative frequencies: 7115, 5075. Address: PO Box

3064 (or 2 Beijing Donglu), Shanghai 200002, China. Tel: +86-21-62082797. Fax: +86-21-62082850. Daily 1055-1500 on 900, 927, 3280, 4950, 9705 including news M-F 1100-1130, 1300-1330 (© BBC Monitoring)

[non] True Light Station (China Radio, Zhen Guang Dian Tai) Full data QSL letter received 27 days after email report, from Richard E Adams, the director of China Radio. QTH email: readams@usa.net pmail: China Radio, 53 Min Chuan West Road 9th Fl, Taipei, Taiwan 10418. The Transmitter site of True Light Station Petropavlovsk-Kamchatsky. Power: 200 kW. Time UT: 1200-1330. Language: Chinese. Frequency: 9450 March-Sept; 5895 Oct-Feb (Qiao Xiaoli, China, Cumbre DX)

**COLOMBIA** La Voz de Los Centauros, 5957.11, came on the air abruptly at 1100 with ID, news and features; listed on 5955 (Chuck Bolland, Lake Worth, FL, swl@qth.net)

**CONGO** The Cuban connexion with R. Congo: Heard in Spanish at 2145-2200, "Radio Congo, Cadena Nacional". Announcer closed saying next broadcast would be at 1300. Although heard on 4765, no mention of it, just 5985 at 0430-0700, 1300-2300; 0700-1700 also on 9610. A very special reason for this, since there are no native speakers of Spanish in this country, as there are in Equatorial Guinea: the present chief of state has a past linked to Marxism-Leninism-Castrism. In order to fight some opposition forces, it seems he has asked for the renewed presence of Cuban troops and advisors (Henrik Klemetz, Sweden, radioescutas, translation summary by gh) Spanish heard instead at 2100-2115 on 4765, seems M-F only, preceded by French and followed by local language (Núcio Ribas, Sergipe, @atividade DX) In June and July, R. Congo kept switching between 5985 and 4765 from one night to the next (Jarmo Patala, Finland, and Mark Veldhuis, Holland, Hard-Core-DX; Craig Seager, ARDXC; Tony Rogers, BDXC-UK)

**CUBA** [non] Salvador Lew has been appointed by Acting Pres. Bush to direct the Office of Cuba Broadcasting (Radio and TV Martí), with instructions to use all means available to overcome jamming. Lew, 72, was a classmate of Fidel Castro at the University of Habana until 1952. He will try to regain the credibility and audience RM has lost in the past decade, down from 70 to 7 percent. For stories such as a boy being coerced not to listen to Radio Martí or La Voz de la Fundación, see <http://www.cubafreepress.org> (via D. Lawton, Conexión Digital)

**CZECH REPUBLIC** R. Prague announced they would be offering special 65th anniversary QSL card for all reception reports received from 31st August to 9th Sept (Alokes Gupta, New Delhi, June 27, DXLD)

[non] WRMI's July schedule showed new times for R. Prague relays: Spanish M-F 0930-1000 9955; Tue-Sat 0000-0030 9955; Daily 0200-0230 7385; English daily 0300-0330 7385 (via John Norfolk)

**ECUADOR** Radio Atlántida, Alausí, heard at 1120 both on 2<sup>nd</sup> harmonic 2960.30 and third, 4440.45, often a "witch doctor"-program of the worst nature (Björn Malm, Quito, Ecuador, SW Bulletin)

On 3279.65 at 0200-0233" talking about Ecuador, ID as "Radio Difusora Cultural". Is it LV del Napo? (Björn Fransson, Gotland, DXLD) R. La Voz del Napo ID on 3279.58 at 1100-1140 (Pedro F. Arrunátegui, Lima, Perú, Chasqui DX) Reactivated (gh)

**ERITREA** [non] V. of Democratic Eritrea via DTK Germany modified schedule July 1: Sat 1400-1459 5925 Eu; Mon & Thu 1700-1759 15670 140 degrees; All in Tigrina (Dr. Hansjörg Biener, BC-DX)

**ETHIOPIA** [non] Radio Rainbow, Voice of Peace and Brotherhood (Amharic: Ye Kestedamena Radio Ye Selamena Wendemamachenet Dimtse), was first heard in September 1997: reportedly operated by an Ethiopian opposition group called Research and Action Group for Peace in Ethiopia and the Horn of Africa (RAGPEHA). Broadcasts via hired transmitters in Germany. Transmissions to Europe may be subject to Summer/Winter time changes. Sign on times may vary. Address: c/o RAGPEHA PO Box 140 104, 53056 Bonn, Germany. In Amharic: Fri 1900-2000 Af 15565; Sat 0800-0900 Eu 6180 (© BBC Monitoring)

Netsanet Radio is operated by Netsanet Le-Ethiopia, a US-based Ethiopian opposition group founded on 27 February 1996. It broadcasts via the internet and on shortwave via a hired relay transmitter in Eastern Europe/CIS. Address: Netsanet Le-Ethiopia, P.O. Box 5398, Takoma Park, MD 20913. Tel: +1 301 562 8597. E-mail: [netsanet@netsanet.com](mailto:netsanet@netsanet.com) Web Site: <http://www.netsanet.com> with 24h ondemand archive audio; in Amharic. Wed 1700-1800 to Af on 12110 (© BBC Monitoring) Same is on Wed and Sun (Transmitter Documentation Project)

**GERMANY** DRM transmission during the IFA Berlin fair from Aug. 23 until Sept. 2: 0905-1500 on 5975. So another DRM SW outlet will be on for presentation purposes, along with Sines (Notes from DTAG Jülich schedule, via Kai Ludwig, Germany, DXLD)

**INDIA** Return postage? Enclosure of cash in letters is forbidden in India and can cause serious trouble (Willi Passmann, Germany, hard-core-dx) Even if sending cash in the mail is not illegal, it almost guarantees that your letter will be stolen. One U.S.\$ (about 45 rupees) is more than a day's wage for many Indians (Mike Brooker, ON, ibid.) Reception Reports may be sent to Director (Frequency Assignments), All India Radio, Room No. 204, Akashwani Bhawan, Parliament Street, New Delhi 110001, India email: [faair@nda.vsnl.net.in](mailto:faair@nda.vsnl.net.in) Of course reports may also be sent to The Station Engineer of the local stations and reply may be got if you are lucky. Return postage is not needed (Jose Jacob, ibid.)

Reactivated AIR Jeypore's first QSL was E-mailed to me from [airjeyp@nte.vsnl.net.in](mailto:airjeyp@nte.vsnl.net.in) Frequencies: 5040 and 6040, 50 kW Continental (Jose Jacob, Somajiguda, Hyderabad)

**IRAN** VOIRI in English:

0030-0130	Am	9022 9835 11970
1100-1230	MEAs	0702 765 15385 15430 15585 21470 21730 100.7
1530-1630	AsAu	7245 9635 11775
1930-2030	Eu	1404 9022 11670 13730
2130-2230	AsAu	9570 13745

(© BBC Monitoring)

**IRAQ** Radio Iraq International, 11787, 2000 ID, German Program with Arabic musical bridges, 2034 into French; 2130 Turkish. I used synchronous AM detection to pick the signal out of the smog as LSB and USB could not open it up; very clear

reception (Tony Berry, Burlington, Ontario, DXLD)

**ITALY** Rai's revised schedule in English:

NAm 0055-0115 9675 11800  
NAf 0445-0500 5975 7235  
WEu 1935-1955 5970 9750  
Eaf 2025-2045 7125 9635 11800  
FE 2205-2230 9675 11900 15265

(via Kim Andrew Elliott, DC) From 0435, not 0445 (Observer, Bulgaria)

**JORDAN** Despite many more frequencies registered, extensive monitoring confirms only these, in Arabic, u.o.s.:

7155 1700-1830 (own program 1700-1800)  
9830 1745-2020  
11690 1300-1630 - English "Radio Jordan 96.3"  
11810 0400-0800, 1030-1500, 1745-2258  
11930 2030-2258  
11960 0500-0810  
15290 1030-1200

Starting and closing times vary daily, and sign-off of 11810, 11930 especially uncertain (Noël R. Green, UK, BC-DX)

**KOREA SOUTH** [non] RKI hopes to add relays via Canada in the North American evening early next year (RKI Multiwave Feedback) No doubt taking up abandoned BBC or RCI usage; it's about time. Listeners have been requesting this for years (gh)

From July 1, RKI via Sackville 9650 at 1130-1159 has encountered co-channel QRM, sometimes severe, from an extremely distorted jammer, typical of China. Perhaps someone else moved onto 9650 provoking them. If this keep up, RKI would be advised to go to clear 11715 for the duration of the summer (gh) No problem here (Bill Matthews, OH) Worse the further west you get; have RKI's Official Monitors caught on? (gh)

**KURDISTAN** [non] No sign of Voice of Mesopotamia on 15230/15770; appears they are off (Olle Alm, Sweden, Cumbre DX)

**MALTA** [non] Voice of the Mediterranean (VOM) is non-commercial external broadcaster, funded by Maltese government. In past has also received some funding from Libyan government for broadcasts to Europe. VOM currently broadcasts via hired transmitters in Italy, Russia. This schedule is based on monitoring observations and info from station. Most are subject to Summer/Winter time changes. Address: VOM, PO Box 143, Valletta CMR 01, Malta. Tel: +356 248080 or +356 240421. Fax: +356 241501. E-mail: [vomradio@vom-malta.org.mt](mailto:vomradio@vom-malta.org.mt) Web Site: <http://www.vom-malta.org.mt> including ondemand archive audio. Address: (studios) - St Francis Ravelin, Floriana VLT 15, Malta.

To EAs in Japanese via Russia: Sun 0500-0600 17570. Rest are to Eu/ME: via Italy 6110 Mon-Sat: 0500 Italian, 0530 Arabic, 0600-0630 English. Via Italy 11770 Sunday: 0700 Italian, 0800 English, 0900 Maltese, 1000 French, 1100-1200 German. Via Russia 12060: 1900-2000 English (Fri Arabic); 2000-2100 Arabic (Sun 2000 French, 2030 German) (© BBC Monitoring)

**MÉXICO** XERTIA, Radio Transcontinental de América varied to 4813, 4870, 4825, trying to fix transmitter back to 4810 (Héctor García Bojorge, México DF, Cumbre DX via DXLD)

**NETHERLANDS** For the upcoming months Alfa Lima International will stay active on 15070 AM starting every Saturday around 2200 or 2300 till the next morning 0700 or just a bit later. May also be on Friday evening. Loads of info and free radio stuff, Find out! [http://www.geocities.com/alfa\\_lima\\_international/](http://www.geocities.com/alfa_lima_international/) or <http://fly.to/freeradio> Our QSL and info sheet?? send reports to: Alfa Lima International, P O Box 663, 7900ar Hoogeveen, the Netherlands; enclose 1 IRC or US\$ for reply. Telephone/Hotline: +31 6 19508938 (Alfred, ALL, via ShortWaveRadio)

Mike Radio International, Sunday July 15 0430-0800 on 9290 AM. First hour dance music, 0530 DJ DAVE show with music from the 80s. Output on the antenna is about 1500 W PEP (we take it easy). The tube Eimac 4/1000 has a capacity of 2 kW (without modulation!) tx/antenna pictures: <http://www.mike48.com> On air at least the first Sunday of every month (MRI via Mike Barraclough, DXLD) Verification says 1 kW Rohde and Schwarz. Address is Mike Radio, P.O. Box 23, 8090AA Wezep, Netherlands, email [mikradio48@hotmail.com](mailto:mikradio48@hotmail.com) (Mike Barraclough, World DX Club Contact)

[non] Three days before BBC WS abandoned relays to North America July 1, R. Netherlands announced it would take over the frequencies immediately with a "Short-wave of Publicit.". This consisted of a half-hour introduction to RN programming by Jonathan Marks which aired repeatedly for three or four days until program feed links to Sackville and Delano could be set up; then regular RN English programming was relayed when available, with extra time filled by the Showcase, which assured listeners that stations other than BBC were still committed to SW; or ad-hoc feature and documentary reruns. This lasted until July 15, when RN formalized new morning broadcasts to NAM via Sackville on two of the former BBC frequencies, 5965 at 1030-1225, 15220 at 1430-1625.

As usual, European stations ignore the Great Center of North America as they go for the extremities: 5965 is useless here in summer, absorbed by 1130 if not earlier, and 1030 UT is too early, 5:30 am CDT. The next broadcast is heard well, but too late (9:30-11:25 am CDT) for those working regular hours, unlike me. Why aren't they using 9515 from Sackville, which was excellent for BBC in both eastern and central North America, say from 1130 to 1325? (gh)

**NEW ZEALAND** From my sporadic listening, ZLXA are running 24 hours, with Radio NZ's National Programme relayed overnight. Last year I was taken out to the transmitter site, about 3 km south of the studio. They have a vertical mast for 1602 AM and I was shocked to see the SW antenna, nothing more than a wire from top of the mast down to the little transmitter shack. To my untrained eye it was nothing more than a random wire! (Bryan Clark, NZ, Cumbre DX)

**OMAN** R. Oman in Arabic the source of two second harmonics, 19470 at 2140 and 19520 at 0031 (David Hodgson, TN, DXLD)

**PAPUA NEW GUINEA** Radio New Ireland, 3905, usually sounds stronger than NBC



4890, but reception depends on ham activity. 1100 news in Pidgin with IDs (Bill Wilkins, MO, DXLD)

Our 'KBBN' SW project was put on hold due to the fact that FBN's David Robison thought the used transmitter he was sending was going to be more trouble than it was worth (Brad Wells, PNG, Cumbre DX)

**PERU** R Reina de la Selva, 5486.76, big ID at 1133 through repetitive huaynos, fair to good for 60w, never heard this well before (David Norrie, New Zealand, DXLD)

R. Ondas del Pacifico, 13565, 0023 ID: "para todos los pueblos de Ayabaca, Ondas del Pacifico", música tropical, 2 x harmonic of 6780v (Mauricio Remillier, Argentina, Conexión Digital)

A day or two after the nearby earthquake, R. Tacna reactivated 9504.9, heard at 1815 with reports about recovery efforts (Hugo López, Chile, Conexión Digital) This frequency had been inactive for six or seven years (Don Moore, Cumbre DX)

R. Unión, 6312.4v, 0220-0630+, wobbly, drifting transmitter but good audio with no distortion. Spanish ballads/pops. After 0330 US pop music of the 50s/60s/70s (Brian Alexander, PA, DXLD) Varies 6312.3-6313.2, back on with listenable at 0057 with fairly good signal; 0800 recheck, a little more raspy and had drifted up 1 kc, wavering. High energy male DJ through echo effect, playing mostly LA pop, but also some Andean flute music, all night long. By 0900 buried under a ute but fine in LSB. Still raspy on 2<sup>nd</sup> harmonic 12629.2 at 1026 (David Hodgson, TN, DXLD) Heard casual announcement of nominal 6115, so enjoy 6315v while it lasts (Henrik Klemetz, Sweden, hard-core-dx)

6299v, Radio Cielo, Chiclayo, provincia de Chiclayo, departamento de Lambayeque at 0200, always using some quite funny "Radio Cielo" IDs with lots of variations; many greetings, announces 6.30 MHz but varies a lot (Björn Malm, Ecuador, SW Bulletin)

**PHILIPPINES** In June, to avoid BBC, FEBC replaced 12095 with 11860, for Asian languages between 1030 and 1400 (Observer, Bulgaria) It must have been at least a year before that we complained about FEBC clashing with BBC on 12095; finally they get off (gh)

**POLAND** After visiting the SW center at Leszczynka (south of Warsaw) I can report that management is not fully aware of their audio problems. Engineers hesitate to consider disturbed audio as something other than co-channel interference. Currently employ five 100 kW Teslas. Disturbances might result from vibrations in the water cooling system which continue into the tube unit (Bernd Trutenau, BC-DX) Terrible Polish R. audio problems on SW since autumn 1994! (Wolfgang Büschel, ibid.)

**ROMANIA** To RRI Bucharest - When listening to your English at 0600-0657 on 15180 I noticed extreme spurious signals about plus/minus 200 kHz. So I advise you to check that transmitter (Erik Køie, Denmark, Radio Denmark, OZ3YI, BC-DX)

**RUSSIA** VOR Space Quiz deadline extended and reextended to Sept. 1, winners announced Sept. 30 (Joe Buch, swprograms) One might assume they had a dearth of entries (gh)

**SPAIN** Aficionados of Latin American music with a jazz slant may enjoy Manteca (Spanish for 'cream') from REE. Two presenters, one in Madrid, one in Miami play an interesting and varied selection, Sundays at 1010 on 15585 to Europe, which can be very good here, and 21540, 21670, 21610; Saturdays 0510 to Americas on 6125, 3210, Europe 9710, 12035 (Martin Roberts, Wales, World DX Club via Mike Barraclough)

Ramón Mendezona, who directed R. España Independiente, Emisora Pirenaica, for 25 of the 31 years it broadcast from communist countries in opposition to the Franco dictatorship, has died in Madrid at the age of 87. He was also head of the Spanish Communist Party (PCE). The station began on 22 July 1940, headed by Dolores Ibárruri, PCE has reported (Esperanza Rufo, El Dial July-August via DXLD) This is only one small item I translated from *El Dial*, Julio-Agosto, a free sample copy of this issue in pdf available from: <http://www.aer-dx.org/gratis.htm> per Pedro Sedano, AER (gh) REI originated from Russian soil during WW II, and tentatively from Saffica, Romania site from about 1948 (Wolfgang Büschel, Germany, DXLD)

**TINIAN** The U.S. IBB SW station has been named in honor of Robert E. Kamosa, who played a key role in development and construction of this facility, which opened in 1999. Mr. Kamosa was VOA director of engineering from 1995 to 1997. He died in 1999. The Tinian relay has six 500 kilowatt transmitters, with two additional 250-kilowatt units now being installed. The site is used for VOA and Radio Free Asia transmissions to East Asia (Kim Elliott, VOA Communications World via John Norfolk)

**UGANDA** In late June, Radio Uganda was being heard with news in English at 1900, sign off at 2100 on 7195 instead of the usual 4976. The other service remained on 5026 (Mike Barraclough, World DX Club) 7195 at low level, muffled audio and unable to make out much; extended use of daytime channel, for reasons unknown (Craig Seager, NSW, ADXN)

**UKRAINE** In mid-July RUI reactivated a 1000 kW transmitter in Mykolaiv on 12040 at 2300-0400 to Eu/NAM beamed 307 degrees, including English 0000, 0300; all other frequencies 100 kW (Alexander Yegorov, RUI) Actually Kopani site, more punchy audio than the 100 kW; should be only 1000 kW SW transmission at present, but monitoring indicates not always in use (Kai Ludwig, Germany, DXLD) Very big signals here on 12040 (Kraig Krist, VA; Liz Cameron, MI) Quite satisfied with 12040, but may not stay at 1000 kW; perhaps only to the end of the World Congress of Ukrainians in the 20s of August (Alexander Yegorov, via Krist, DXLD)

**UK** BBC New Media Director Ashley Highfield said in an interview to "The Guardian", that BBC Online users worldwide may have to pay for that service in future. So closure of BBCWS on SW to NAM, Au and NZ makes sense (Wolfgang Büschel, Germany, DXLD) Just as NAM frequencies were dropped July 1, BBCWS added two new frequencies for "Mexico", 11810 00-01, and 11835 01-05. 11835 is pretty good here in Boston (Bill Ricker, N1VUX, DXLD) These were from Delano, but a week later switched to Okeechobee in the 0000-0300 period, 0300-0500

still Delano. WYFR probably wanted to maintain the 3-hour swap it had with Merlin UK transmitters; yes, these are quite good north of the border in Alto México (gh)

Salama Radio International, new station heard at 1930 instead of LRA36 on 15475, African pops from Britain, also with Jos, Nigeria, address (Paul Ormandy, NZ, ARDXC) No QRM from Antarctica on weekends; IDs in English, French, Hausa, Arabic and Fufulde and lots of music from northern, central Nigeria. Website: <http://www.salamaradio.org> Transmissions apparently via Merlin (Tony Jones, Paraguay, Cumbre DX) Obvious from website this is Christian evangelical, who think Islam is a creeping menace in Africa (gh) Speech by the president, Dr Abdallah. Address in Nigeria is: Box 287, Jos, Plateau State. e-mail: [admin@salaradio.org](mailto:admin@salaradio.org) (Björn Fransson, Gotland, DXLD) Clandestine, with anti-Nigerian government program (Anker Petersen, Denmark, DXLD) Woofferton site (Wolfgang Büschel, ARDXC)

[non] R. Caroline plans to broadcast to America 9 hours per week via 50 kW WBCQ on 17495, 7415, to create a larger audience for our webcasts in USA, and satellite in Europe (<http://www.radiocaroline.co.uk/select.htm> via Mike Terry, BDXC-UK)

**USA** Long form programs about life in the United States will return to the VOA English lineup, but not in July, as originally hoped, and probably not until September or later. Management and the labor union are working out some issues. VOA began a new Spanish program July 2 for the Andean region, M-F 1130-1200 via Greenville 9535, 11925, 13790 (VOA Communications World via John Norfolk)

Michael Ketter (Brother X) from Complex Variables Studio, has been made Program Director of WBCQ - The Planet. He has started a dialogue with BBC. There is a good chance WBCQ will be airing much of the old North America Service programming (mostly news and entertainment), by August (Tasha Femkins, CVS, Pittsburgh, via James D. Strader, swprograms) Ketter as PD allowed Allan Weiner to concentrate on building additional production facilities, a new antenna system for WBCQ-3, and building a local FM station from scratch. For details on the latest news in programming developments, including WBCQ picking up any BBCWS programming, check out Allan Weiner World Wide, UT Saturdays 0000, and Ketter's new show *The Planet*, UT Wednesdays 0100 on 7415 (Steve Coletti, swprograms)

FCC International Bureau public notices page contains:

- WBCQ: add 50 kW xmtr (not 100) and a second antenna, a reversible rhombic.
- Sale of WRNO to Good News World Outreach has been approved.
- Application has been filed by Blue Ridge Communications d/b/a WGTG Radio Station for a new SW station in Coffee County, TN (Manchester the largest town) at 35-37-27 N, 86-00-52 W. [It is closer to Nashville, not to Copper Hill - gh]
- Apr 11, 2001: authorized sale of KAIJ, Dallas, from Two if By Sea to Peoria Broadcasting Services, Inc. Have no idea who they are, but probably a religious group.
- KNLS, Alaska, has applied to add a second 100 kw xmtr and a second curtain dipole antenna.
- A new SW station on the Kenai Peninsula south of Anchorage has been filed by Aurora Communications, at Ninilchik (Mike Dörner, WORLD OF RADIO)

On July 18, WWCR dropped 7435, leading to schedule changes on #1 and #4 (André Schmidt, Germany) Affects WORLD OF RADIO Friday at 0930 on 9475 ex-7435 with 9475 used 0900-1100; Bro. Stair service expands 7460 to 2200-1300. From Sept 1, #1 change from 9475 to 3215 earlies from 0100 to 0000, affecting WOR UT Monday 0000 (gh, from <http://www.wwcr.com>)

**URUGUAY** R. Banda Oriental, Sarandi del Yi, 6155, with Bolivia's Fides absent, audible between 0100 and 0300\*, clearest after 0200, with Uruguayan pop music and requesting reports to [norasan@adinet.com.uy](mailto:norasan@adinet.com.uy) or Calle Sarandi 328, Sarandi del Yi (Durazno), Uruguay (Henrik Klemetz, Sweden, DXLD)

Realizing that their 150-watt undermodulated transmitter on 9620 has no chance against 350 kW from Spain, SODRE engineers tried in July keeping it on all night, with classical and light orchestral music, so it should be DXable in the 0500-1000 period after Spain is off (Horacio Nigro, Uruguay, Conexión Digital)

**VIETNAM** [non] Voice of Khmer Krom, of the Khmer Kampuchea Krom Federation, a US-based opposition group of Cambodians from South Vietnam which seeks "rights to freedom and self determination" for the people of Kampuchea Krom - a region of southern Vietnam. Address: Khmer Kampuchea Krom Federation, PO Box 6239, Lakewood, CA 90714. Tel: +1 562 598 5431. Fax: +1 562 598 8089. E-mail: [vokk@khmerkrom.org](mailto:vokk@khmerkrom.org) Web Site: <http://www.khmerkrom.org> Fri 1400-1500 in Cambodian to As on 15725 (© BBC Monitoring) Site?

Khmer Krom, 15725, carrier was there already when I switched on at 1335. Weak, about S=3, clearly indicating Far East site. Buzzy carrier on 15725 seems to be the same as on 15440 at 2200, so I guess they are using the same transmitter [as Falungong]. My best guess is the site is Tavrichanka [Russia] using the same buzzy 2 x 120 kW pair that was used for Voice of Democratic Burma on 5945 and for WCNA on 15445 last winter (Olle Alm, Sweden, BC-DX) Nice reply from Executive Director of Voice of Khmer Kampuchea Krom (VOKK), Sen Thach via [vokk@khmerkrom.org](mailto:vokk@khmerkrom.org) (Björn Fransson, Gotland, DXLD)

**YEMEN** QSL-letter and card from R Sana'a, 9780 on their English at 1800-1858. Correct address: P.O. Box 2371, Sana'a (different from WRTH 2001); after 108 days, signed by Technical Director, Engineer Mohammed H. Bather, who replied in English (Anker Petersen, Denmark, EDXP)

**ZAMBIA** Christian Voice operates from a farm 35 km southwest of Lusaka using a 100-kW Continental. Aims to cover both Zambia and neighbouring countries. Address: Christian Voice, Private Bag E606, Lusaka, Zambia. Tel: +260 1 274251. Fax: +260 1 274526. E-mail: [voice@zamnet.zm](mailto:voice@zamnet.zm) Web Site: <http://www.christianvision.com> UK Address: Christian Vision, Ryder Street, West Bromwich, B70 0EJ. Tel: +44 121 5226087. Fax: +44 121 5226083. Daily in English to Af and Domestic: 0300-0600 6065, 0600-1500 9865, 1500-0300 4965 (© BBC Monitoring)

Until the Next, Best of DX and 73 de Glenn!

## 0004 UTC on 15070

PIRATE: (Euro) Radio Alpha Lima. Oldies music tunes audible past 0016. SIO=252. US pirates monitored; **WHYP**, 6945.5 (LSB) 0218-0230+ with coverage of the annual Brownyard Invitational Croquet Tournament; **Voice of the Angry Bastard** 6950, 2348-0004. Pigmeat Martin with C&W music to Belfast maildrop address. **Radio Bingo** 6949.9AM, 0410-0411\*, good signal. (Harold Frodge, Midland, MI)

## 0005 UTC on 11870

YUGOSLAVIA: Radio Yugoslavia. National news to coverage on national war crimes. (David W. Weronka, Benson, NC) National news 0430, 11870 with election updates to ethnic music. (James Boynton, Newton, MA)

## 0030 UTC on 9022

IRAN: VIRI. Musical bridge, station identification to Iranian anthem. Frequency schedule to Holy Korean recitations. (William McGuire, Cheverly, MD) - see this month's *QSLing the Middle East* feature for QSLing trends and addresses. - ed.

## 0100 UTC on 9665

RUSSIA: Voice of Russia. Station ID to national and regional news. (McGuire, MD) 0220 on 9725, news on U.S. government. (Weronka, NC) Segment focus on flat tax rate helps Russian businesses on 11675, 1816. (Bob Fraser, Cohasset, MA)

## 0102 UTC on 6913.6

PIRATE: Voice of Bizarro World. Usual bizarreness including DAMN spot. Bizarro program ended at 0109 into **Radio Free Speech** (relay?). Techno music at 0110 to 0117. *Bureau of Missing Persons* drama at 0117. SIO=423. (Frodge, MI)

## 0130 UTC on 9870

AUSTRIA: Radio Austria Int'l. Station identification to political news update and report on immigration. (McGuire, MD) Austria's **Adventist World Radio** relay 2100-2129\* on 15195. *New Life* program to Africa. (Lee Silvi, Mentor, OH)

## 0130 UTC on 9745

ECUADOR: HCJB. *Saludos Amigos* mailbag program to religious music. (Boynton, MA) *Studio 9* show, featuring interview with a doctor-author of a book on herbal medicines. 21455, 1210 *Morning in the Mountains*. (Fraser, MA; Tom Banks, Dallas, TX)

## 0200 UTC on 9400

BULGARIA: Radio Bulgaria. English service to North America with good signal, despite utility interference. (Lee Silvi, Mentor, OH) 11900 at 1940. *St. George's Day Folk Music Contest* segment / / 9400. (Fraser, MA) 2145-2200\* 11900 with Bulgarian folk music and features. SIO=443. (Frodge, MI)

## 0155 UTC 9755

SWEDEN: Radio Sweden. Station interval signal to ID and frequency schedule. *Sixty Degrees North* program with good signal quality. (McGuire, MD) Website discussion. at 0155 on 13625. (Weronka, NC)

## 0400 UTC on 9435

ISRAEL: Kol Israel. Israeli national news, weather and sports update. Closing greetings to Russian service at 0425; station audible 17545 at 1915. (Boynton, MA) National to regional news 0415-0415 to French service 0415. (McGuire, MD)

## 0500 UTC on 11725

NEW ZEALAND: Radio New Zealand Int'l. Checkpoint program with national news and weather to kiwi bird interval signal at 0500. (Boynton, MA) 9885 at 0950 & 1100. Segment of historical recordings to music program. (Dom Mallozzi N1DM, Natick, MA)

## 0630 UTC on 7260

VANUATU: Radio Vanuatu. Drum beat signal at 0630 to local English messages and weather at 0632. Station identification at 0650 and 0700, during religious programming. Signal greatly improved over the time period, being virtually overcome with static crashes at the beginning, to extremely audible at 0706. (Mark Fine, Remington, VA)

## 0655 UTC on 15380

SAUDI ARABIA: BSKSA. Arabic service for Holy Koran recitations, fair signal quality. (Boynton, MA)

## 0859 UTC on 4975

BRAZIL: Radio Iguatemi. Portuguese. Station ID with frequency references of, "650, 3325 and 4975 kHz... Religious program, "A oracao da manha." SINPO=23432. Interference from Peru's **Radio del Pacifico** on frequency. (Arnaldo Slaen, Buenos Aires, Argentina) Brazil's **Radio Relogio Federal** 2151-2215, 4905; **Radio Inconfidencia** 2315-2332, 6010 with promo ID to soccer game as, "Inconfidencia apresentando esporte". Slight adjacent interference. **Radio Clube Paranaense** 2320 on 6040. (Daniele Canonica, Muggio, Switzerland)

## 1101 UTC on 9985

PALAU: KHBN Voice of Hope. Open carrier on frequency to brief music tune at 1102. Flute/trumpet melody to ID with address quote to *Soldier of the Light* Christian song. Contemporary Christian vocals to 1131 ID and address repeat. Strong co-channel utility interference. (Guy Atkins, Bonney Lake, WA/HCDX)

## 1135 UTC on 21605

UNITED ARAB EMIRATES: Radio Dubai. *The Wise World of Islamic Music* program. (Fraser, MA)

## 1245 UTC on 17670

FINLAND: Radio Finland. Report on the recent *Summer Holiday Fair* // 15400. (Fraser, MA) (Weronka, NC)

## 1645 UTC on 6070

CANADA: CFRX. Promo's "the station that cares...CFRB 10-10," followed by "the station with more than just headlines CFRB 10-10." Call in segments including item on Clinton coming to Toronto. News, weather, and sports update 1700. NO CFRX identification, SIO=3+33. (Frodge, MI)

## 2058 UTC on 3374.9

ANGOLA: Radio Nacional de Angola. External service noted with opening music to interval signal. Station identification, frequency quote to time signal at 2100. ID repeat into English world newscast. Signal very weak, minimal interferences. (Mark Veldhuis, Netherlands) 4950, 1820 Portuguese comments, pop music, ID and abrupt 1834\*. (Enzio Gehrig, Donia, Spain/HCDX)

## 2110 UTC on 9855

KUWAIT: Radio Kuwait. Station ID, national and regional news and topics of Israel and Ariel Sharon. (McGuire, MD)

## 2115 UTC on 13660 USB

CUBA: Radio Havana. English world business news commentary. SIO=3+53. (Frodge, MI)

## 2130 UTC on 11730

GUAM: Adventist World Radio relay. Presumed Mandarin service to Asia // 15265. (Silvi, OH)

## 2145 UTC on 15545

CZECH REP: Radio Prague. Report national art exhibits, // 11600. (Fraser, MA; Boynton, MA) Interval signal to ID, national news 15545, 2230. (McGuire, MD)

## 2211 UTC on 4815

BURKINA FASO: Radio Burkina. Excellent signal quality with French news to "Radio Burkina" ID at 2214. Reggae music with minimal interferences from RTTY and Brazilian **Radio Difusora** on frequency. (Veldhuis, NLD)

## 2237 UTC on 11845

TURKEY: Voice of Turkey. *Faith Tourism*-a tour of religious buildings in Istanbul. World news with *Turkish Press Review*. VOT contest coverage at 2214. (Frodge, MI)

## 2245 UTC on 9736

PARAGUAY: Radio Nacional del Paraguay. Spanish. Music to local time check as, "son las 18:48 minutos..." Cafe Oro Negro commercial to movie promo, ads for Shell Eco Gas and Uvita wines. Sports program to, "en la frecuencia de 9735 kilohertz onda corta de Radio Nacional del Paraguay." (Slaen, ARG)

## 2326 UTC on 9875

LITHUANIA: Radio Vilnius. Closing items for the Lithuanian service. Station ID, followed by national news and economy report. (McGuire, MD)

Thanks to our contributors - Have you sent in YOUR logs?  
Send to Gayle Van Horn, c/o Monitoring Times (or e-mail  
gayle@webworkz.com)  
English broadcast unless otherwise noted.

## Adventist World Radio wows collectors

From Adrian Peterson, host of the *Wavescan* program on AWR, comes word of a series of new QSL cards of special interest to collectors. Twenty-four new cards will be issued every three months for the next three years, and each will be available until the stock is depleted. The first series features two aspects of radio history, followed by the second series honoring art work of young children.

The first card in the third series will be introduced in September 2001. There are seven cards in the *New Millennium Series* and present seven stages in the *Drama of the Ages* throughout the history of planet earth. There are 12 different designs in two styles, with printed QSL text on the reverse. All 24 cards are presented in full color and a full set obtained over a period of time will enhance any radio listener's collection. The preferred addresses for these QSL cards are:

**Worldwide address:** Adventist World Radio, 39 Brendon Street, London W1H 5HD, United Kingdom.

**Continental European languages:** Adventist World Radio, Casella Postale 383, 47100 Forlì, Italy.

**Wavescan only:** Adventist World Radio, Box 29235, Indianapolis, IN. 46229 USA.

Radio Prague will offer their special 65<sup>th</sup> anniversary card, available to September 9, 2001. Don't miss this one for your collection. Station address: Czech Radio, Vinohradska 12, 12099 Prague 2, Czech Republic.

Radio Alfa Lima International continues to QSL for European pirate chasers. Most weekends they are audible on 15070 kHz, 21890 AM (and somewhere in the 48 meter band!) around 2300 UTC until 0700. Their website [http://www.geocities.com/alfa\\_lima\\_international/](http://www.geocities.com/alfa_lima_international/) contains

loads of info, free radio stuff and a live webcam when broadcasting. Try your luck for a QSL and info sheet, along with one IRC or a U.S. dollar to; P.O. Box 663, 7900ar Hooegeveen, The Netherlands. Telephone/hotline: +31 6 19508938.



### ALBANIA

Radio Tirana, 6115 kHz. Full data sheet signed by Clara and Ceseka, along with a handwritten note of appreciation, plus scenic postcard of Tirana. Received in 60 days for an English report and two U.S. dollars. Station address: Rruga Ismail Qemali Nr. 11, Tirana, Albania. (Joe Squashic, Wake Forest, NC)

### ARMENIA

Voice of Armenia, 9965 kHz. Full data QSL, plus letter, schedule and two stickers. Received in 414 days for an English report, two mail reminders plus a FAX. Station address: Alex Manoukian Street 5, Yerevan 375025, Republic of Armenia. (George Glotzbach, NM/Cumbre DX)

### IRAQ

Radio Iraq International, 11785 kHz. No data station card unsigned, plus schedule and a "thanks for listening" note (unsigned). Received in nine months for an English report and one U.S. dollar. Station address: P.O. Box 8145, Baghdad 12222, Iraq. (Duane Hadley, Bristol, TN)

### ISRAEL

Galehi Zahal (Israel Defense Forces Radio), 6895 kHz. Full data card unsigned. Received in 120 days for an English report. Station address: Military Post Office 1005, Zahal, Israel. (Frank Hillton, Charleston, SC)

Kol Israel, 9435 kHz. No data card unsigned, plus program schedule. Received in 29 days for an English report and two U.S. dollars. Station address: P.O. Box 1082, Jerusalem 91010, Israel. (Squashic, NC)

### MAURITANIA

Radio Mauritanie, 4845 kHz. Full data *Ici Nouakchott* map card signed with Arabic initials, stamped with station seal. Received

in 120 days for a taped cassette of programming and one IRC. Station address: Boite Postal 200, Noukchott, Republique Islamique de Mauritanie. (Tom Banks, Dallas, TX)

### MEDIUM WAVE

KLBO, 1330 kHz AM. No data confirmation letter signed by Rick Anderson, plus *Radio Free Texas* bumper sticker. Received in seven days for an AM report. Station address: 1706 E. Sealy, Monahans, TX 79756. (Patrick Griffith-NONNKK/WPE9HW, Westminster, CO)

WMIB, 1660 kHz AM. Computer printed QSL card signed by Phil Beckman-Operations Manager, who mentioned he now works at WJGO in Ft. Myers, FL. Received in 246 days for an AM report. Station address: 601 Elkcam Circle, Marco Island, FL 33937. (Griffith, CO)

XEUT, Tijuana BC, 1630 kHz AM. Very nice 8 1/2 x 11 *Certificado de Sintonia* on heavy parchment paper, plus Spanish QSL letter signed by Martha Adriana Marquez-Jefa de Radio Universidad with two official rubber stamp seals, program schedule, poster and two bumper stickers. Mailing address: Autonomia de Baja California (UABC) Radio, 233 Paulin Ave., P.O. Box MSC 5163, Calexico, CA 92231-2646. (Griffith, CO)

### PIRATE

(Europe) Radio Tower, 6036 kHz. No data letter. Received in 13 days for an English report, postcard and bumper sticker. Received in 13 days for an English report and two U.S. dollars. Station address: P.O. Box 49, CP 7475 ZG, Markelo, Netherlands. (Ross Comeau, Andover, MA)

### QATAR

Qatar Broadcasting Service, 9535 kHz. Full data QSL card signed by Jassem Mohammed Al Qattan-Head of Public Relations, plus booklet and schedule. Received in 65 days for an English report. Station address: P.O. Box 3939, Doha, Qatar. (Hillton, SC) QBS, 7210 kHz, signed by veri signer. Received in just under 3-1/2 years for an English report and four follow-ups. (Richard Hankison, FL/Cumbre DX)

### SYRIA

Radio Damascus, 13610 kHz. Full data map card signed by Director General of Broadcasting & TV, plus an extra souvenir scenery postcard. Received in 95 days for an English report. Station address: Syrian Arab Republic, Omyyad Square, Damascus, Syria. (Sam Wright, Biloxi, MS) Full data 12085 kHz, *The Citadel del 12-16 Century*, with illegible signature, plus program schedule, sticker and *Syria Times* newspaper via registered mail. (Sgrulletta, Cumbre DX)

### TURKEY

Voice of Turkey, 9655 kHz. Full data QSL card, plus sticker and schedule. Received in 46 days for an English report and two U.S. dollars. Station address: P.O. Box 333, Yenisehir 06443 Ankara, Turkey. (Squashic, NC)

### YEMEN

Radio Sana'a, 9780 kHz. Full data station card signed by Eng. Mohamed H. Bather, plus personal letter. Received in 102 days for an English report. Station address: Republic of Yemen Radio Ministry of Information, P.O. Box 2182, (or) P.O. Box 2371, Sana'a, Republic of Yemen. (Erich Bergmann, Ansbach, Germany, Cumbre DX)



## An Ear to the Tower of Babel

For the last two months, we have been – in effect – exploring the broadcasting side of shortwave radio in the aftermath of the BBC's decision to abandon it, at least insofar as North America and Australasia are concerned. Just because the **BBC World Service** thinks shortwave is dead here, doesn't make it so. One suspects that, in the final analysis, it is the BBC that will suffer from its action far more than shortwave listeners.

In July, we pointed out that the BBC, despite its best (or maybe its worst) efforts, can still be heard quite well on shortwave in the regions it ostensibly abandoned. It just takes a little flexibility and ingenuity on the part of those wanting to hear it. In August, we reminded that there is a slew of other fine broadcasters and programs on shortwave – just in case one was laboring under the misconception that the BBC was all there was. This month, the first of the new "listening season," let's widen our horizons even a little more.

### Rediscover All Your Radio Offers

Sit down, turn on your receiver and just manually scan the bands, stopping for a moment at each station you hear. Note the cacophony of languages that play across the dial. In a sense, one can experience the initial confusion probably encountered by the ancients coming upon the biblical tower of Babel.

If you're an expatriate from a country whose principal language is not English, you probably tune into one of these stations regularly. If you're like me (a monolingual American), for the longest time you've probably just by-passed these points of the dial on the way to something more familiar. Over time, though, I've come to better appreciate these services. Although I'm still tragically monolingual, other languages have become a sort of new music for me – their metre, cadences and tonal inflections sometimes every bit as sonically satisfying as any song or instrumental piece.

However, over and above that admittedly offbeat observation, virtually all of these stations do play "real" music. That's the universal language, right? The music on these services also is much more likely to reflect that heard "at home." The sense of vicarious travel is greatly enhanced. No degree in foreign languages is nec-

essary to enjoy and appreciate. Furthermore, just in case you might want to learn what it is those voices are saying, several stations offer language lessons as part of the programming on their English services. (**Deutsche Welle** and **Spanish Foreign Radio**, aka **Radio Exterior de Espana**, are two that do so. Check the program listings in *MT's Shortwave Guide* for further information.) For students of foreign language, listening to these broadcasts regularly can be a great way to reinforce what is learned and keep the student in good practice.

### Traveling Vicariously

Personally, I find that some of the best *sounding* services – those with the best production values and variety of "sounds" – are in the primary language of the country originating the broadcast.

That stands to reason since it is more likely that broadcasters would be more comfortable working in their own tongue and have more readily available resources to draw from in using it. I get a sense that I'm listening in on a family conversation of sorts since the service is presumably intended for expatriates that reside here. North America being home to so many nationalities, there is a wide palette of language services projected through our air every day and those signals are, on the whole, very strong and in the clear.

So, for your listening pleasure, as they say, here is a selected listing of these services and when and where to tune to hear them. **All of these put very strong signals into North America and can be heard over extensive portions of the day.**

This list does **not** include every primary language service broadcast. All international broadcasters transmit services in their home language, albeit for shorter periods than the stations provided in the listing. Good sources for time and frequency information include *Passport to Worldband Radio*, which has an excellent section entitled "Voices from Home," and each station's Internet site. Glenn Hauser's "Global Forum" column, here in *MT*, sometimes carries news of these broadcasts, as do shortwave club bulletins like *The NASWA Journal* and *ODXA's Listening In*.

As always, good listening!

### Selected Primary Language Broadcasts to North America

Country/Station	UTC/GMT	Frequency (kHz.)	Notes
<b>Albania - R. Tirana</b>			
	0000-0600	6090, 7270	7270 usually best
<b>Canada - CBC North</b>			
	1100-0500	9625	Inuktitut, Cree, French, English
<b>Germany - Deutsche Welle</b>			
	0000-0200	11785, 13780, 15410	A truly "world" service in German
	0200-0400	6075, 6100, 9735, 11785	
	0400-0600	6075, 6100, 9640, 9735	
	1200-1400	17730	
	1400-1700	17730, 17875	
	1800-2000	17860	
	2000-2200	17810, 17860	
	2200-0000	11785, 13780, 15275, 15410, 17860	
<b>Greece - Foni Tis Helladas</b>			
	0000-0350	7475, 9420, 12015	Excellent Greek music throughout
	0600-0800	11900	
	1200-1500	9775	
	1600-2200	17705	
	2000-2200	17565	
<b>Israel - Reshet Bet</b>			
	0100-0500	9390	Home Service 2 <sup>nd</sup> Network relay (news, current affairs and magazines primarily)
	0330-0500	11590	
	0500-1800	15760	
	0500-2100	17535	
	1600-0330	11585	
	2100-0100	13635	
<b>Italy - RAI</b>			
	0130-0305	9675, 11800	Daily
	1352-1730	17780	On Sun. with "Domenica Sport"
	1400-1425	17780, 21520	Weekdays
	1830-1905	17780, 21520	Weekdays
	2230-0050	9675, 11800	Daily
<b>Kuwait - R. Kuwait</b>			
	0930-1605	13620	Extensive periods with Middle Eastern music
	1615-1800	11990	
	1745-2130	15505	
	1800-0000	9855	
	2145-0530	11675	
<b>Portugal - RDP</b>			
	0500-0700	15585	Daily
	1200-2000	17575	Weekends only normally; to 2300 at times
	2300-0200	9715, 11655	Daily
<b>Spain - REE/RNE</b>			
	0200-0500	6055, 6125, 9540	True "world" service in Spanish
	0500-0600	6125	
	1000-1200	21700	
	1200-1300	15170, 21700	
	1300-1500	15170, 17595, 21700	
	1500-1900	17850, 21700	
	1900-2300	15110, 17850	
	2300-0200	9540	
<b>Turkey - TRT</b>			
	0000-0400	9445, 9460, 11885	Excellent Turkish music
	0400-0600	9445, 9460	
	2200-0000	9445, 9460, 11885	

[Sources: Station Information, Glenn Hauser's various publications, Al Quaglieri in *The NASWA Journal*.]



## HOW TO USE THE SHORTWAVE GUIDE

0000-0100 twhfa USA, Voice of America 5995am 6130ca 7405am 9455af  
 ① ② ⑤ ③ ④ ⑥ ⑦

### Convert your time to UTC.

Broadcast time on ① and time off ② are expressed in Coordinated Universal Time (UTC) – the time at the 0 meridian near Greenwich, England. To translate your local time into UTC, first convert your local time to 24-hour format, then add (during Daylight Savings) 4, 5, 6, or 7 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each page.

Note that all dates, as well as times, are in UTC; for example, a show which might air at 0030 UTC *Sunday* will be heard on *Saturday* evening in America (in other words, 8:30 pm Eastern, 7:30 pm Central, etc.).

### Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. On the top half of the page English broadcasts are listed by UTC time on ①, then alphabetically by country ③, followed by the station name ④. (If the station name is the same as the country, we don't repeat it, e.g., "Vanuatu, Radio" [Vanuatu].)

If a broadcast is not *daily*, the days of broadcast ⑤ will appear in the column following the time of broadcast, using the following codes:

#### Day Codes

s/S	Sunday
m/M	Monday
t/T	Tuesday
w/W	Wednesday
h/H	Thursday
f/F	Friday
a/A	Saturday
D	Daily
mon/MON	monthly

In the same column ⑤, irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

### Choose the most promising frequencies for the time, location and conditions.

The frequencies ⑥ follow to the right of the station listing; all frequencies are listed in kilohertz (kHz). Not all listed stations will be heard from your location and virtually none of them will be heard all the time on all frequencies.

Shortwave broadcast stations change some of their frequencies at least twice a year, in April and October, to adapt to seasonal conditions. But they can also change in response to short-term conditions, interference, equipment problems, etc. Our frequency manager coordinates published station schedules with confirmations

and reports from her monitoring team and MT readers to make the Shortwave Guide up-to-date as of one week before publication.

To help you find the most promising signal for your location, immediately following each frequency we've included information on the target area ⑦ of the broadcast. Signals beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible.

#### Target Areas

af:	Africa
al:	alternate frequency (occasional use only)
am:	The Americas
as:	Asia
au:	Australia
ca:	Central America
do:	domestic broadcast
eu:	Europe
irr:	irregular (Costa Rica RFPI)
me:	Middle East
na:	North America
om:	omnidirectional
pa:	Pacific
sa:	South America
va:	various

### Choose a program or station you want to hear.

Selected programs appear on the lower half of the page for prime listening hours – space does not permit 24 hour listings nor can every station be listed. However, listings for the most popular stations and selected lesser-known stations illustrate the variety available on shortwave. The format of the listings alternates among three different styles – by station, by genre and by day – month by month. Times listed are approximate and programs are subject to change.

The program listings emphasize broadcasts targeted to North America. In most cases, the stations and programs listed should be readily receivable in North America using a portable radio. Most broadcasters produce one broadcast in English per day that is repeated over a 24 hour period to all areas. If you are able to listen to transmissions to other areas of the world during "non-prime time" hours, referring to the prime time listings for those stations will likely be helpful in determining what programs will be broadcast.

Occasionally, a program or station listing may be followed by a reference to another listing for the same program or station at a different time. This is done to conserve space and make it possible to provide more listings.

## MT MONITORING TEAM

Gayle Van Horn Frequency Manager gayle@webworkz.com	John Figlio Program Manager jfiglio1@nycap.rr.com
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Mark Fine, VA  
fineware@erols.com

## Program Highlights

### John Figlio

### Radio Netherlands' Bold Move

It was a bold stroke. No sooner had the BBC abandoned its frequencies for North America, when **Radio Netherlands** popped up on every one of them with a *Shortwave Showcase*, demonstrating once again its flair for serving well its long-time listeners and for capturing the attention of new ones. The reaction from listeners was very positive and has prompted RN to expand its service to North America to include morning transmissions of two hours each to the east and west coasts. Frequencies are 5965 kHz. (1030-1225UT) and 15220 kHz. (1430-1625). The new program listings now appear in the SWG. If you haven't done so yet, be sure to drop RN a note telling them how much you appreciate their efforts at [letters@rnw.nl](mailto:letters@rnw.nl) or Box 222, Hilversum, The Netherlands.

### New Programs

If a consistent flow of new programs is a sign of vitality, then international broadcasting appears to be quite healthy. **Pop! Goes Asia** (S 0510, 1410) is a new feature on *Radio Japan*, presenting the cultures and lifestyles of Asian countries through their popular music. **Music Log** (W 0625, 1125) is another new program, but no further information was available ... **Biz China**, looking at Chinese business, is *China Radio International's* newest program airing Saturdays immediately after the news ... **Up Close** premiered in August on *Radio Sweden*. It airs the first and third Tuesday/Wednesday of each month, in place of *MediaScan*. *Radio Australia* has added **The Buzz** (M2330, A0430, S 1005), **Country Breakfast** (F 2030, A 0030) and **Business Report** (A 0730 and 2230, S 1130) ... The **BBC** has two new entries that premiered last month: **What's the Problem?** (H 2345) and **Go Digital** (W 0105, H 1505) ... Descriptions are in this month's listings.

# Shortwave Guide



## 0000

0000	0015	Cambodia, National Radio Of	11940as			
0000	0015	Japan, Radio	6145na	17810pa		
0000	0027	Czech Rep, Radio Prague Intl	7345na	11615na		
0000	0030	Australia, Christian Voice	17850as			
0000	0030	Australia, Radio	9660pa	12080pa	15240as	15415as 17580pa
		17775as 17795va	21740va			
0000	0030	Egypt, Radio Cairo	9900am			
0000	0030	Thailand, Radio	9690va			
0000	0030	UK, BBC World Service	3915as	5965as	5975am	6195as 7105as
		9410me 9590am	9915as	11810as	11945as	11955sa 12095as
		15280as 15310as	15360as	17615as	17790as	
0000	0045	India, All India Radio	9705as	9950as	11620as	13605as
0000	0056	North Korea, Voice of Korea	4405va	11460na	11710na	13760na
		15180na				
0000	0057	Canada, R Canada International	11895as			
0000	0100	Anguilla, Caribbean Beacon	6090am			
0000	0100	Australia, ABC/Alice Springs	4835do			
0000	0100	Australia, ABC/Katherine	5025do			
0000	0100	Australia, ABC/Tennant Creek	4910do			
0000	0100	Canada, CBC Northern Service	9625do			
0000	0100	Canada, CFRX Toronto ON	6070do			
0000	0100	Canada, CFVP Calgary AB	6030do			
0000	0100	Canada, CHNX Halifax, NS	6130do			
0000	0100	Canada, CKZN St John's NF	6160do			
0000	0100	Canada, CKZU Vancouver BC	6160do			
0000	0100	Costa Rica, R for Peace Intl	15050va	21815usb		
0000	0100	Costa Rica, University Network	5030am	6150am	7375am	9724sa
		11870am 13749na				
0000	0100	Ecuador, HCJB	9745na	15115na	21455usb	
0000	0100	Finland, Scandv Weekend Radio	5990va	11720va		
0000	0100	Guyana, Voice of	3289do	5949do		
0000	0100	Japan, Radio	6145na			
0000	0100	Malaysia, Radio	7295do			
0000	0100	Malaysia, RTM Kota Kinabalu	5980do			
0000	0100	Malaysia, RTM Sarawak	7160do			
0000	0100	Namibia, Namibian BC Corp	3270af	3289af		
0000	0100	Netherlands, Radio	6175na	9590na	9845na	
0000	0100	New Zealand, R New Zealand Int	17675pa			
0000	0100	New Zealand, ZLXA	3935do			
0000	0100	Papua New Guinea, NBC	9675do	11880irr		
0000	0100	Singapore, SBC Radio One	6150do			
0000	0100	Solomon Islands, SIBC	5020do	9545do		
0000	0100	Spain, R Exterior Espana	15385na			
0000	0100	Ukraine, R Ukraine International	5905eu	7320as	9640as	12040na
0000	0100	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
		6350va 6458va	6847va	10320va	10940va	12579va 12689va
		13254va 13362va	16847va			
0000	0100	USA, KAJI Dallas TX	13815va			
0000	0100	USA, KLTN Salt Lake City UT	15590na			
0000	0100	USA, KWHR Naalehu HI	17510as			
0000	0100	USA, Voice of America	5995am	6130am	7405am	9455am 9775am
		11695am 13740am				
0000	0100	USA, WBCQ Monticello ME	7415na	9330na		
0000	0100	USA, WEWN Birmingham AL	5825na	13615na		
0000	0100	USA, WHRA Greenbush ME	7580eu			
0000	0100	USA, WHRI Noblesville IN	5745va	7315am		
0000	0100	USA, WINB Red Lion PA	12160am			
0000	0100	USA, WJCR Upton KY	7490am	13595as		
0000	0100	USA, WRMI Miami FL	9955sa			
0000	0100	USA, WRNO New Orleans LA	7355va			
0000	0100	USA, WSHB Cypress Crk SC	7535am	9430am	15285sa	
0000	0100	USA, WTJC Newport NC	9370na			
0000	0100	USA, WWBS Macon GA	11910na			
0000	0100	USA, WWCR Nashville TN	5070na	7435na	9475na	13845na
0000	0100	USA, WWFV McCaysville GA	5085va	6890am		
0000	0100	USA, WYFR Okkechobee FL	6085na	9505na		
0000	0100	Vanuatu, Radio	3945do	7260do		
0000	0100	Zambia, Christian Voice	4965do			
0005	0010	Croatia, The Voice of Croatia	9925irr			
0030	0100	Australia, Christian Voice	17850as	21680pa		
0030	0100	Australia, Radio	9660pa	12080va	15415as	17580pa
		17750as 17755as	17795va	21740va		
0030	0100	Iran, Voice of Islamic Rep. of Iran	9022am	9835am	11970am	
0030	0100	Lithuania, Radio Vilnius	11690eu			
0030	0100	Sri Lanka, Sri Lanka BC Corp	15425as	4940do	6005as	6075as 9770as
		15425as				
0030	0100	Thailand, Radio	15395as			
0030	0100	UK, BBC World Service	5965as	5975am	6195as	7105as 9410me
		9590am 9915sa	11810as	11955sa	12095as	15280as 15360as
		17790as				
0030	0100	USA, Voice of America	7215as	9770as	11760as	15185as 15290as
		17740as 17820as				
0030	0100	Yugoslavia, Radio	11870am			
0045	0100	Pakistan, Radio	11650as	15455as		
0050	0100	UK, International BC Tamil	11570as			
0055	0100	Italy, RAI International	9675na	11800na		

## 0100

0100	0115	Italy, RAI International	9675na	11800na		
0100	0115	Pakistan, Radio	11650as	15455as		
0100	0125	Netherlands, Radio	6165na	9845na		
0100	0127	Czech Rep, Radio Prague Intl	5915na	7345na		
0100	0127	Vietnam, Voice of	9525na			

0100	0130	s	Germany, Universal Life	9435as		
0100	0130		Hungary, Radio Budapest	9560na		
0100	0130		Iran, Voice of Islamic Rep. of Iran	9022am	9835am	11970am
0100	0130		Slovakia, R Slovakia International	5930na	7230ca	9440sa
0100	0130	twfha	USA, Voice of America	5995am	6130am	7405am 9455am 9775am
			13740am			
0100	0130		Uzbekistan, Radio Tashkent	7190as	9375as	9530as 9715as
0100	0145		Germany, Deutsche Welle	6040na	9640am	11810na 13720am
0100	0156		North Korea, Voice of Korea	3560va	11734va	15230va 17735va
0100	0159		Canada, R Canada International	5960am	9755am	13670am 13770am
			15170am			
0100	0200		Anguilla, Caribbean Beacon	6090am		
0100	0200	vi	Australia, ABC/Katherine	5025do		
0100	0200	vi	Australia, ABC/Tennant Creek	4910do		
0100	0200		Australia, Christian Voice	21550as	21680pa	
0100	0200		Australia, Radio	9660pa	12080pa	15240as 15415as 17580pa
			17750as 17755as	17795va	21725pa	
0100	0200		Canada, CBC Northern Service	9625do		
0100	0200		Canada, CFRX Toronto ON	6070do		
0100	0200		Canada, CFVP Calgary AB	6030do		
0100	0200		Canada, CHNX Halifax, NS	6130do		
0100	0200		Canada, CKZN St John's NF	6160do		
0100	0200		Canada, CKZU Vancouver BC	6160do		
0100	0200		China, China Radio International	9570na		
0100	0200		Costa Rica, R for Peace Intl	7455va	15050va	21815usb
0100	0200		Costa Rica, University Network	5030am	6150am	7375am 9724sa
			11870am 13749na			
0100	0200		Cuba, Radio Havana	6000na	9820na	11705na
0100	0200		Ecuador, HCJB	9745na	15115na	21455usb
0100	0200	a/monthly	Finland, Scandv Weekend Radio	5990va	5990va	11720va
0100	0200		Guyana, Voice of	3289do	5949do	
0100	0200		Indonesia, Voice of	9525as	11784as	15149as
0100	0200		Japan, Radio	11860pa	11870me	11880me 15325as 17685pa
			17810as 17835sa	17845as		
0100	0200		Malaysia, Radio	7295do		
0100	0200		Malaysia, RTM Kota Kinabalu	5980do		
0100	0200		Namibia, Namibian BC Corp	3270af	3289af	
0100	0200		Netherlands, Radio	6175na	9590na	
0100	0200		New Zealand, R New Zealand Int	17675pa		
0100	0200		New Zealand, ZLXA	3935do	7290do	
0100	0200	vi	Papua New Guinea, NBC	9675do		11880irr
0100	0200		Russia, Voice of Russia WS	7180na	11825na	12000na 17595na
0100	0200		Singapore, SBC Radio One	6150do		
0100	0200	vi	Solomon Islands, SIBC	5020do	9545do	
0100	0200		Spain, R Exterior Espana	15385na		
0100	0200		Switzerland, Swiss R International	9885am		
0100	0200		UK, BBC World Service	5965as	5975am	6195as 9410as 9590am
			9915sa 11835as	11955sa	12095as	15280as 15310as 15360as
			17790as			
0100	0200		USA, Armed Forces Radio	4278va	4319va	4993va 5765va
			6350va 6458va	6847va	10320va	10940va 12579va 12689va
			13254va 13362va	16847va		
0100	0200		USA, KAJI Dallas TX	5755va		
0100	0200		USA, KJES Vado NM	7555na		
0100	0200		USA, KLTN Salt Lake City UT	7510na		
0100	0200		USA, KWHR Naalehu HI	17510as		
0100	0200		USA, Voice of America	7115as	9635as	11705as 11725as 11820as
			13650as 15250as	17740as		
0100	0200		USA, WBCQ Monticello ME	7415na	9330na	
0100	0200		USA, WEWN Birmingham AL	5825na	13615na	
0100	0200		USA, WHRA Greenbush ME	7580eu		
0100	0200		USA, WHRI Noblesville IN	5745va	7315am	
0100	0200		USA, WINB Red Lion PA	12160am		
0100	0200		USA, WJCR Upton KY	7490am	13595as	
0100	0200	twfha	USA, WRMI Miami FL	7385na		
0100	0200	sm	USA, WRMI Miami FL	9955am		
0100	0200		USA, WRNO New Orleans LA	7355va		
0100	0200		USA, WSHB Cypress Crk SC	7535na	9430am	15285sa
0100	0200		USA, WTJC Newport NC	9370na		
0100	0200		USA, WWCR Nashville TN	5070na	7435na	13845na
0100	0200		USA, WWFV McCaysville GA	5085va		
0100	0200		USA, WYFR Okkechobee FL	6065na	9505na	15060as
0100	0200		Vanuatu, Radio	3945do	4960do	7260do
0100	0200	vi	Zambia, Christian Voice	4965do		
0100	0200		Croatia, The Voice of Croatia	9925irr		
0130	0145	vi	Libya, Voice of Africa	11815af		17725af
0130	0200		Austria, R Austria International	9870na		
0130	0200		Sweden, Radio	13625as		
0130	0200		UK, RTE Radio	6155ca		
0130	0200	twfha	USA, VOA Special English	9775am	7405am	13740am
0130	0200	twfha	USA, Voice of America	5995am	6130am	9455am
0140	0200		Vatican City, Vatican Radio	9650au	12055au	
0145	0200		Albania, R Tirana International	6115na	7160na	

## 0200

0200	0210	mtwhf	Greece, Voice of	7475va	9420va	11645va	12105va
0200	0230	sm w fa	Belarus, R Belarus International	7185do	6070eu	7210eu	
0200	0230		Myanmar, Radio	7185do			
0200	0230	a	UK, Wales Radio Int/Merlin	7995na			
0200	0230		USA, KJES Vado NM	7555na			
0200	0230		USA, WINB Red Lion PA	12160am			
0200	0245		Germany, Deutsche Welle	11965as	13710as	15370as	
0200	0245		Iraq, Radio Iraq International	7157irr	9684irr	11785irr	
0200	0256		North Korea, Voice of Korea	11845va	13650va		
0200	0256		Romania, R Romania International	11940na	15105as	15180as	15340na
			17735as 17790pa				
0200	0257		Canada, R Canada International	15260as	17860as		

SELECTED PROGRAMMING BEGINS ON PAGE 55



# Shortwave Guide



0200	0300		Anguilla, Caribbean Beacon	6090am				
0200	0300	twfha	Argentina, RAE	11710am				
0200	0300	vi	Australia, ABC/Alice Springs	4835do				
0200	0300	vi	Australia, ABC/Katherine	5025do				
0200	0300	vi	Australia, ABC/Tennant Creek	4910do				
0200	0300		Australia, Christian Voice	21550as	21680pa			
0200	0300		Australia, Radio	9660pa	12080va	15240as	15415as	15515va
			17580va 17750as	21725va				
0200	0300		Bulgaria, Radio	11700na				
0200	0300		Canada, CBC Northern Service	9625do				
0200	0300		Canada, CFRX Toronto ON	6070do				
0200	0300		Canada, CFVP Calgary AB	6030do				
0200	0300		Canada, CHNX Halifax, NS	6130do				
0200	0300		Canada, CKZN St John's NF	6160do				
0200	0300		Canada, CKZU Vancouver BC	6160do				
0200	0300		Costa Rica, R for Peace Intl	7455va	15050va			
0200	0300		Costa Rica, University Network	5030am		7375am	9724sa	
			11870am 13749na	13749na				
0200	0300		Cuba, Radio Havana	6000na	9820na	11705na		
0200	0300		Ecuador, HCJB	9745na	15115na	21455usb		
0200	0300		Egypt, Radio Cairo	9475am				
0200	0300	a/monthly	Finland, Scandv Weekend Radio	5990va	11720va			
0200	0300		Guyana, Voice of	3289do	5949do			
0200	0300		Kenya, Kenya BC Corp	4885irr	4915irr			
0200	0300		Malaysia, Radio	7295do				
0200	0300		Malaysia, RTM Kota Kinabalu	5980do				
0200	0300		Namibia, Namibian BC Corp	3270af	3289af			
0200	0300		Netherlands, Radio	6175na				
0200	0300		New Zealand, R New Zealand Int	17675pa				
0200	0300		New Zealand, ZLXA	3935do				
0200	0300	vi	Papua New Guinea, NBC	9675do	11880irr			
0200	0300		Russia, Voice of Russia WS	7180na	12000na	17595na		
0200	0300		Singapore, SBC Radio One	6150do				
0200	0300	vi	Solomon Islands, SIBC	5020do	9545do			
0200	0300		South Korea, R Korea Intl	7275na	11725sa	11810sa	15575na	
0200	0300		Sri Lanka, Sri Lanka BC Corp	6005as	6075as	6130do	9770as	
			15425as					
0200	0300		Taiwan, Radio Taipei International	5950na	9680na	11740am	15270as	
			15345as					
0200	0300		UK, BBC World Service	5975am	6135am	6195as	9410as	9770af
			9915sa 11835as	11955va	12095as	15280as	15310as	15360as
			17790as					
0200	0300		UK, Merlin Network One	9430na				
0200	0300		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
			6350va 6458va	6847va	10320va	10940va	12579va	12689va
			13254va 13362va	16847va				
0200	0300		USA, KAIJ Dallas TX	5755va				
0200	0300		USA, KTBN Salt Lake City UT	7510na				
0200	0300		USA, KWHR Naelehu HI	17510as				
0200	0300		USA, Voice of America	7115as	9635as	11705as	11725as	11820as
			13650as 15250as	17740as	17820as			
0200	0300		USA, WBCQ Monticello ME	7415na				
0200	0300		USA, WBCQ Monticello ME	9330na				
0200	0300		USA, WEWN Birmingham AL	5825na				
0200	0300		USA, WHRA Greenbush ME	7580eu				
0200	0300		USA, WHRI Noblesville IN	5745va	7315am			
0200	0300		USA, WJCR Upton KY	7490am	13595as			
0200	0300		USA, WRMI Miami FL	7385na				
0200	0300		USA, WRNO New Orleans LA	7355va				
0200	0300		USA, WSHB Cypress Crk SC	5850na	7535am	9430na		
0200	0300		USA, WTJC Newport NC	9370na				
0200	0300		USA, WWCR Nashville TN	3215na	5070na	5935na	7435na	
0200	0300		USA, WWFV McCaysville GA	5085va				
0200	0300		USA, WYFR Okeechobee FL	6065na	9505na			
0200	0300	vi	Vanuatu, Radio	3945do	7260do			
0200	0300		Zambia, Christian Voice	4965do				
0200	1215		Cambodia, National Radio Of	11940as				
0205	0210		Croatia, The Voice of Croatia	9925irr				
0215	0220		Nepal, Radio 5005as	7165as				
0230	0257		Vietnam, Voice of	9525na				
0230	0300		Albania, R Tirana International	6115na	7160na			
0230	0300		Hungary, Radio Budapest	9570na				
0230	0300		Philippines, Radyo Pilipinas	11885pa	15120pa	15270pa		
0230	0300		Slovakia, Adventist World Radio	7235as				
0230	0300		Sweden, Radio	9495am	9755na			
0230	0300		Switzerland, Swiss R International	9885am				
0230	0300	sm f	USA, WINB Red Lion PA	12160am				
0250	0300		Vatican City, Vatican Radio	7305am	9605am			
0250	0300	vi	Zambia, National BC Corp	6165do	6265do			

## 0300

0300	0310		Vatican City, Vatican Radio	7305am	9605am			
0300	0327		Czech Rep, Radio Prague Intl	7345na	7385na	9870na		
0300	0330		Egypt, Radio Cairo	9475am				
0300	0330		S Africa, Channel Africa	6035af				
0300	0330		Thailand, Radio	15395am				
0300	0330		UK, BBC World Service	3255af	5975am	6005af	6135am	6190af
			6195eu 7120af	7160af	9410eu	11730af	12035as	12095me
			15280as 15310as	15360as	15575me	17760as	17790as	21660as
			21830as					
0300	0330		USA, WBCQ Monticello ME	7415na				
0300	0330	s twfha	USA, WBCQ Monticello ME	9330na				
0300	0345		Germany, Deutsche Welle	9535na	9640na	13780am	15105na	
0300	0400		Anguilla, Caribbean Beacon	6090am				
0300	0400	vi	Australia, ABC/Alice Springs	4835do				
0300	0400	vi	Australia, ABC/Katherine	5025do				
0300	0400	vi	Australia, ABC/Tennant Creek	4910do				
0300	0400		Australia, Christian Voice	21550as	21680pa			
0300	0400		Australia, Radio	9660pa	12080pa	15240as	15415as	15515va
			17580va 17750as	21725va				
0300	0400	mtwhf	Bhutan, Bhutan BC Service	6035do				

0300	0400	vi	Botswana, Radio	3356do	4820do	7255do		
0300	0400		Canada, CBC Northern Service	9625do				
0300	0400		Canada, CFRX Toronto ON	6070do				
0300	0400		Canada, CFVP Calgary AB	6030do				
0300	0400		Canada, CHNX Halifax, NS	6130do				
0300	0400		Canada, CKZN St John's NF	6160do				
0300	0400		Canada, CKZU Vancouver BC	6160do				
0300	0400		China China Radio International	9690na				
0300	0400		Costa Rica, Faro del Caribe	5054ca	6175ca	9644ca		
0300	0400		Costa Rica, R for Peace Intl	7455va	15050va			
0300	0400		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
			11870am 13749na	17645as				
0300	0400		Cuba, Radio Havana	6000na	9820na	11705na		
0300	0400		Ecuador, HCJB	9745na	15115na	21455usb		
0300	0400	a/monthly	Finland, Scandv Weekend Radio	5990va	11720va			
0300	0400	vi	Guatemala, Radio Cultural	3300do	5955do			
0300	0400		Guyana, Voice of	3289do				
0300	0400	sm	Honduras, Radio Luz y Vida	3250ca				
0300	0400		Japan, Radio	17825ca	21610pa			
0300	0400		Kenya, Kenya BC Corp	4885irr	4915irr			
0300	0400	vi	Lesotho, Radio	4800do				
0300	0400		Malaysia, Radio	7295do				
0300	0400		Malaysia, Voice of Islam	6175as	9750as	15295as		
0300	0400		Namibia, Namibian BC Corp	3270af	3289af			
0300	0400		Netherlands, Radio	6135na	6175na			
0300	0400		New Zealand, R New Zealand Int	17675pa				
0300	0400		Oman, Radio Sultanate of	15355va				
0300	0400	vi	Papua New Guinea, NBC	9675do	11880irr			
0300	0400		Philippines, Radyo Pilipinas	11885		15120pa	15270pa	
0300	0400		Russia, Voice of Russia WS	7180na	11750na	12000na	15455na	
			17650na 17660na	17690na				
0300	0400		Singapore, SBC Radio One	6150do				
0300	0400	vi	Solomon Islands, SIBC	5020do	9545do			
0300	0400		Sri Lanka, Sri Lanka BC Corp	6005as	6075as	6130do	9770as	
			15425as					
0300	0400		Taiwan, Radio Taipei International	5950na	9680na	11875pa	15320as	
0300	0400		Turkey, Voice of	7270af	11655va	21715as		
0300	0400		Uganda, Radio	7196do				
0300	0400		Ukraine, R Ukraine International	12040as	7150as	7320as	7410as	9640as
0300	0400		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
			6350va 6458va	6847va	10320va	10940va	12579va	12689va
			13254va 13362va	16847va				
0300	0400		USA, KAIJ Dallas TX	5755va				
0300	0400		USA, KTBN Salt Lake City UT	7510na				
0300	0400		USA, KWHR Naelehu HI	17510as				
0300	0400		USA, Voice of America	5855af	6080af	7105af	7275af	7290af
			7340af 9575af	9885af	17895af			
0300	0400		USA, WEWN Birmingham AL	5825na				
0300	0400		USA, WHRA Greenbush ME	7580eu				
0300	0400		USA, WHRI Noblesville IN	5745va	7315am			
0300	0400	s	USA, WINB, Red Lion PA	12160am				
0300	0400		USA, WJCR Upton KY	7490am	13595as			
0300	0400		USA, WMLK Bethel PA	9465eu				
0300	0400		USA, WRMI Miami FL	7385na				
0300	0400		USA, WRNO New Orleans LA	7395am				
0300	0400		USA, WSHB Cypress Crk SC	5850na	11550eu			
0300	0400		USA, WTJC Newport NC	9370na				
0300	0400		USA, WWCR Nashville TN	3215na	5070na	5935na	7435na	
0300	0400		USA, WWFV McCaysville GA	5085va				
0300	0400	vi	USA, WYFR Okeechobee FL	6065na	9505na			
0300	0400		Vanuatu, Radio	3945do	7260do			
0300	0400		Zambia, Christian Voice	6065do				
0300	0400	vi	Zambia, National BC Corp	6165do	6265do			
0310	0315		Zimbabwe, Zimbabwe BC Corp	4828do	6045do			
0315	0315		Croatia, The Voice of Croatia	9925na				
0315	0340		Vatican City, Vatican Radio	7305am	9605am	9660af		
0325	0358		Vatican City, Vatican Radio	9660af				
0330	0345	vi	Honduras, Radio Litoral	4832irr				
0330	0357		Libya, Voice of Africa	11815af	15435af	17725af		
0330	0357		Czech Rep, Radio Prague Intl	11600as	15470as			
0330	0357		Vietnam, Voice of	9795na				
0330	0400		Austria, AWR Europe	17635as				
0330	0400		Myanmar, Radio	9730do				

# Shortwave Guide



0400	0430	h	USA, WBCQ Monticello ME	9330na			
0400	0430		USA, WRMI Miami FL	7385na			
0400	0445		Germany, Deutsche Welle	7225af	9565af	9765af	13690af
0400	0455		USA, WYFR Okeechobee FL	6065na	9355eu	9505na	
0400	0456		China China Radio International	9560na	9730na		
0400	0456		Romania, R Romania International	11940na	15365na	17735as	21480as
0400	0458		New Zealand, R New Zealand Int	17675pa			
0400	0500		Anguilla, Caribbean Beacon	6090am			
0400	0500	vl	Australia, ABC/Alice Springs	4835do			
0400	0500	vl	Australia, ABC/Katherine	5025do			
0400	0500	vl	Australia, ABC/Tennant Creek	4910do			
0400	0500	vl	Botswana, Radio	3356do	4820do	7255do	
0400	0500		Canada, CBC Northern Service	9625do			
0400	0500		Canada, CFRX Toronto ON	6070do			
0400	0500		Canada, CFVP Calgary AB	6030do			
0400	0500		Canada, CHNX Halifax, NS	6130do			
0400	0500		Canada, CKZN St John's NF	6160do			
0400	0500		Canada, CKZU Vancouver BC	6160do			
0400	0500		Costa Rica, R for Peace Intl	7455va	15050va		
0400	0500		Costa Rica, University Network	5030am	6150am	7375am	9724sa
			11870am 13749na	17645as			
0400	0500		Cuba, Radio Havana	6000na	9820na	11705na	
0400	0500		Ecuador, HCJB	9745na	15115na	21455usb	
0400	0500	a/monthly	Finland, Scandv Weekend Radio	6170va	11720va		
0400	0500	vl	Guatemala, Radio Cultural	3300do	5955do		
0400	0500		Guyana, Voice of	3289do			
0400	0500		Kenya, Kenya BC Corp	4885irr	4915irr		
0400	0500	vl	Lesotho, Radio	4800do			
0400	0500		Malaysia, Radio	7295do			
0400	0500		Malaysia, Voice of Islam	6175as	9750as	15295as	
0400	0500		Myanmar, Radio	9730do			
0400	0500		Namibia, Namibian BC Corp	3270af	3289af		
0400	0500		Netherlands, Radio	6175na			
0400	0500		New Zealand, ZLXA	3935do	7290do		
0400	0500	vl	Nigeria, Radio/Enugu	6025do			
0400	0500	vl	Papua New Guinea, NBC	9675do	11880irr		
0400	0500		Russia, Voice of Russia WS	7180na	11750na	12000na	17565na
			15455na 17650na	17660na			
0400	0500		Singapore, SBC Radio One	5020do			
0400	0500	vl	Solomon Islands, SIBC	7196do			
0400	0500		Uganda, Radio	3255af	5975am	6005af	6135am 6175am
0400	0500		UK, BBC World Service	6190af 6195eu	7120af	7160af	9410eu 12035eu 12095me
			15280as 15310as	15420af	15575me	17640af	17760as 17790as
			21660as 21830as				
0400	0500		USA, Armed Forces Radio	6350va	6458va	6847va	
			13254va 13362va	16847va			
0400	0500		USA, KAIJ Dallas TX	5755va			
0400	0500		USA, KATN Salt Lake City UT	7510na			
0400	0500		USA, KWHR Naalehu HI	17780as			
0400	0500		USA, Voice of America	4960af	5855af	6080af	7275af 7290af
			9530va 9575af	11965me	15205va	17895af	
0400	0500		USA, WEWN Birmingham AL	5825na			
0400	0500		USA, WHRA Greenbush ME	7580eu			
0400	0500		USA, WHRI Noblesville IN	5745va	7315am		
0400	0500		USA, WJCR Upton KY	7490am			
0400	0500		USA, WMLK Bethel PA	9465eu			
0400	0500		USA, WSHB Cypress Crk SC	11930eu	15195af		
0400	0500		USA, WTJC Newport NC	9370na			
0400	0500		USA, WWFV McCaysville GA	5085va			
0400	0500		Zambia, Christian Voice	6065do			
0400	0500	vl	Zambia, National BC Corp	6165do	6265do		
0400	0500	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
0405	0410		Croatia, The Voice of Croatia	9925irr			
0405	0500		USA, WWCR Nashville TN	3210na	5070na	5935na	7435na
0427	0525	a	Liberia, Voice of Hope	12060af			
0430	0500		Australia, Christian Voice	21550as	21680pa		
0430	0500		Australia, Radio	9660pa	12080pa	15240as	15415as 15515va
			17580pa 21725pa				
0430	0500		Italy, Italian Radio Relay Service	3985va			
0430	0500		Netherlands, Radio	6165na	9590na		
0430	0500	vl	Nigeria, Radio/Ibadan	6050do			
0430	0500	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0430	0500	vl	Nigeria, Radio/Lagos	3326do	4990do		
0430	0500		S Africa, Adv World Radio Africa	11975af			
0430	0500		Sri Lanka, Sri Lanka BC Corp	6130do			
0430	0500	mtwhfa	Swaziland, Trans World Radio	3200af	4775af		
0430	0500		Switzerland, Swiss R International	9885am			
0430	0500		USA, WBCQ Monticello ME	7415na			
0430	0500	s twhfa	USA, WRMI Miami FL	7385na			
0430	0500		Yugoslavia, Radio	11870na			
0445	0500		Italy, RAI International	5975af	7235af		
0445	0500		USA, WYFR Okeechobee FL	9355eu			

## 0500

0500	0515		Canada, CBC Northern Service	9625do			
0500	0515	s hfa	USA, KVOH Los Angeles CA	9975na			
0500	0520		Vatican City, Vatican Radio	4005eu	5885eu	7250eu	9660af
			11625af 15570af				
0500	0530		Australia, Christian Voice	21550as			
0500	0530	as	Australia, Radio	17750as			
0500	0530		France, R France International	11710af	17800af		
0500	0530	s twhfa	Mexico, R Mexico International	9705am	11770am		
0500	0530		Netherlands, Radio	6165na	9845na		
0500	0530		S Africa, Adv World Radio Africa	5960af	6015af		
0500	0530		S Africa, Channel Africa	11720af			
0500	0530		Switzerland, Swiss R International	9610eu			
0500	0530	s twhfa	USA, WRMI Miami FL	7385na			
0500	0530	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
0500	0545		Germany, Deutsche Welle	9690na	9785na	11985na	

0500	0600		Anguilla, Caribbean Beacon	6090am			
0500	0600	vl	Australia, ABC/Alice Springs	4835do			
0500	0600	vl	Australia, ABC/Katherine	5025do			
0500	0600	vl	Australia, ABC/Tennant Creek	4910do			
0500	0600	vl	Botswana, Radio	3356do	4820do	7255do	
0500	0600		Canada, CFRX Toronto ON	6070do			
0500	0600		Canada, CFVP Calgary AB	6030do			
0500	0600		Canada, CHNX Halifax, NS	6130do			
0500	0600		Canada, CKZN St John's NF	6160do			
0500	0600		Canada, CKZU Vancouver BC	6160do			
0500	0600		Costa Rica, R for Peace Intl	7455va	15050va		
0500	0600		Costa Rica, University Network	5030am	6150am	7375am	9724sa
			11870am 13749na	17645as			
0500	0600		Cuba, Radio Havana	9550na	9820na	9830na	
0500	0600		Ecuador, HCJB	9745na	15115na	21455usb	
0500	0600	a/monthly	Finland, Scandv Weekend Radio	6170va	11720va		
0500	0600		Guyana, Voice of	3289do			
0500	0600		Italy, Italian Radio Relay Service	3985va			
0500	0600		Japan, Radio	5975eu	6110na	7230eu	11715as 11760as
			13630na 15195as	17810pa	21755pa		
0500	0600		Kenya, Kenya BC Corp	4885irr	4915irr		
0500	0600		Kuwait, Radio	15110as			
0500	0600	vl	Lesotho, Radio	4800do			
0500	0600	vl	Liberia, R Liberia International		5100do		
0500	0600		Malaysia, Radio	7295do			
0500	0600		Malaysia, RTM Sarawak	7160do			
0500	0600		Malaysia, Voice of	6175va	9750va	15295va	
0500	0600		Malaysia, Voice of Islam	6175as	9750as	15295as	
0500	0600		Myanmar, Radio	9730do			
0500	0600		Namibia, Namibian BC Corp	3270af	3289af		
0500	0600		Netherlands, Radio	6175na			
0500	0600		New Zealand, R New Zealand Int	15340pa			
0500	0600		New Zealand, ZLXA	3935do	7290do		
0500	0600	vl	Nigeria, Radio/Enugu	6025do			
0500	0600	vl	Nigeria, Radio/Ibadan	6050do			
0500	0600	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0500	0600	vl	Nigeria, Radio/Lagos	3326do	4990do		
0500	0600		Nigeria, Voice of	7255af	11770af	15120na	
0500	0600	vl	Papua New Guinea, NBC	9675do	11880irr		
0500	0600		Russia, Voice of Russia WS	17635au	17685au	21790au	
0500	0600		Singapore, SBC Radio One	6150do			
0500	0600	vl	Solomon Islands, SIBC	5020do	9545do		
0500	0600		Spain, R Exterior Espana	6055na			
0500	0600		Sri Lanka, Sri Lanka BC Corp	6130do			
0500	0600		Swaziland, Trans World Radio	4775af	6035af	9500af	
0500	0600		Uganda, Radio	7196do			
0500	0600		UK, BBC World Service	5975am	6005af	6175am	6190af 6195eu
			7160af 9410eu	9740as	11760me	11765af	11940af 12095eu
			15280as 15310as	15360as	15420af	15575as	17640af 17760as
			17790as 17885af	21660as			

0500	0600		USA, Armed Forces Radio	6350va	6458va	6847va	4278va	4319va	4993va	5765va
				13254va	13362va	16847va	10320va	10940va	12579va	12689va
0500	0600		USA, KAIJ Dallas TX	5755va						
0500	0600		USA, KATN Salt Lake City UT				7510na			
0500	0600		USA, KWHR Naalehu HI	11565pa			17780as			
0500	0600		USA, Voice of America	5970af			6035af	6080af	7195af	9530va
			11965me 12080af	13670af			15205va			
0500	0600		USA, WBCQ Monticello ME				7415na			
0500	0600		USA, WEWN Birmingham AL				5825na			
0500	0600		USA, WHRA Greenbush ME				11730af			
0500	0600		USA, WHRI Noblesville IN				5745va	7315am		
0500	0600		USA, WJCR Upton KY	7490am			13595as			
0500	0600		USA, WMLK Bethel PA	9465eu						
0500	0600		USA, WRNO New Orleans LA				7395am			
0500	0600		USA, WSHB Cypress Crk SC				9840af	11930eu		
0500	0600		USA, WTJC Newport NC	9370na						
0500	0600		USA, WWCR Nashville TN				3210na	5070na	5935na	7460na
0500	0600		USA, WYFR Okeechobee FL				5985na	9355eu	11580eu	
0500	0600	vl	Vanuatu, Radio	3945do			4960do	7260do		
0500	0600		Zambia, Christian Voice	6065do						
0500	0600	vl	Zambia, National BC Corp				6165do	6265do		
0505	0510		Croatia, The Voice of Croatia				9470au			
0515	0530	h a	USA, KVOH Los Angeles CA				9975na			
0520	0530		Vatican City, Vatican Radio				9660af	11625af	15570af	
0525	0600	vl	Ghana, Ghana BC Corp				3366do	4915do		
0530	0540	vl	Cameroon, CRTV Radio Buea				6005do			
0530	0545	ma	USA, KVOH Los Angeles CA				9975na			
0530	0600		Australia, Christian Voice				21550as	21680pa		
0530	0600		Australia, Radio	9660pa			12080va	15240pa	15515va	17580pa
			17750as 21725pa							
0530	0600		Georgia, Georgian Radio				11805eu			
0530	0600		S Africa, Adv World Radio Africa				11970af			
0530	0600		Thailand, Radio	21765eu						
0530	0600		UAE, Radio Dubai	13675au			15435au	17830au	21700au	
0530	0600	smtwhf	UK, BBC World Service	17885af						
0530	0600	vl	Zimbabwe, Zimbabwe BC Corp				5975do	6045do		
0532	0600		Austria, R Austria International				6155eu	13730eu		
0545	0600	ma	USA, KVOH Los Angeles CA				9975na			

# Shortwave Guide



0600	0700	vi	Australia, ABC/Alice Springs	4835do				
0600	0700	vi	Australia, ABC/Katherine	5025do				
0600	0700	vi	Australia, ABC/Tennant Creek	4910do				
0600	0700		Australia, Christian Voice	21550as	21680pa			
0600	0700		Australia, Radio	9660pa	12080pa	15240pa	15415as	15515va
			17580pa 17750as	21725pa				
0600	0700	vi	Botswana, Radio	7255do	9600do			
0600	0700		Canada, CFRX Toronto ON	6070do				
0600	0700		Canada, CFVP Calgary AB	6030do				
0600	0700		Canada, CHNX Halifax, NS	6130do				
0600	0700		Canada, CKZN St John's NF	6160do				
0600	0700		Canada, CKZU Vancouver BC	6160do				
0600	0700		Costa Rica, R for Peace Intl	7455va	15050va			
0600	0700		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
			11870am 13749na	17645as				
0600	0700		Cuba, Radio Havana	9550na	9820na	9830na		
0600	0700		Ecuador, HCJB	9745na	11680eu	15115na	21455usb	
0600	0700	a/monthly	Finland, Scandv Weekend Radio	6170va	11720va			
0600	0700		Germany, Overcomer Ministries	9430pa	13810au			
0600	0700	vi	Ghana, Ghana BC Corp	3366do	4915do			
0600	0700		Guyana, Voice of	3289do	5949do			
0600	0700	mtwhf/vl	Italy, Italian Radio Relay Service	7120va				
0600	0700		Japan, Radio	7230eu	11740pa	13630pa	15195as	17870pa
			21755pa					
0600	0700		Kenya, Kenya BC Corp	4885irr	4915irr			
0600	0700		Kuwait, Radio	15110as				
0600	0700	vi	Lesotho, Radio	4800do				
0600	0700	vi	Liberia, ELWA	4760do				
0600	0700	vi	Liberia, R Liberia International		5100do			
0600	0700		Malaysia, Radio	7295do				
0600	0700		Malaysia, RTM Sarawak	7160do				
0600	0700		Malaysia, Voice of	6175va	9750va	15295va		
0600	0700		Myanmar, Radio	9730do				
0600	0700		Namibia, Namibian BC Corp		3270af	3289af		
0600	0700		Netherlands, Radio	6175na				
0600	0700		New Zealand, R New Zealand Int		15340pa			
0600	0700		New Zealand, ZLXA	3935do	7290do			
0600	0700	vi	Nigeria, Radio/Enugu	6025do				
0600	0700	vi	Nigeria, Radio/Ibadan	6050do				
0600	0700	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
0600	0700	vi	Nigeria, Radio/Lagos	3326do				
0600	0700		Nigeria, Voice of	7255af	11770af	15120na		
0600	0700	vi	Papua New Guinea, NBC		9675do	11880irr		
0600	0700		Russia, Voice of Russia WS	15490au	17635au	17685au	21790au	
0600	0700		Sierra Leone, Sierra Leone BS		6150do			
0600	0700	vi	Singapore, SBC Radio One	9545do				
0600	0700		Solomon Islands, SIBC	5020do				
0600	0700		Sri Lanka, Sri Lanka BC Corp		3316do			
0600	0700		Swaziland, Trans World Radio		4775af	6035af	9500af	
0600	0700		UK, BBC World Service	6055af	6175am	6190af	6195eu	7160af
			9410eu 9740as	11760me	11765af	11940af	12095eu	15310as
			15360as 15485eu	15565eu	17640af	17760as	17790as	21660as
0600	0700	as	UK, BBC World Service	17885af				
0600	0700		USA, Armed Forces Radio		4278va	4319va	4993va	5765va
			6350va 6458va	6847va	10320va	10940va	12579va	12689va
			13254va 13362va	16847va				
			USA, KAU Dallas TX	5755va				
0600	0700		USA, KTN Salt Lake City UT		7510na			
0600	0700		USA, KWHR Naalehu HI	11565pa	17780as			
0600	0700		USA, WEWN Birmingham AL		5825na			
0600	0700		USA, WHRA Greenbush ME		11730af			
0600	0700		USA, WHRI Noblesville IN		5745va	7315am		
0600	0700		USA, WJCR Upton KY	7490am	13595as			
0600	0700		USA, WMLK Bethel PA	9465eu				
0600	0700		USA, WRNO New Orleans LA		7395am			
0600	0700		USA, WSHB Cypress Crk SC		11615af	13650af		
0600	0700		USA, WTJC Newport NC	9370na				
0600	0700		USA, WWCR Nashville TN		3210na	5070na	5935na	7460na
0600	0700		USA, WYFR Okesechoebe FL		5985na	7355eu		
0600	0700	vi	Vanuatu, Radio	3945do	4960do	7260do		
0600	0700		Yemen, Rep of Yemen Radio		9780me			
0600	0700	vi	Zambia, Christian Voice	9865do				
0600	0700	vi	Zambia, National BC Corp		6165do	6265do		
0600	0700	vi	Zimbabwe, Zimbabwe BC Corp		5975do	6045do		
0605	0610		Croatia, The Voice of Croatia		9470irr			
0610	0615	mtwhf	Vatican City, Vatican Radio		4005eu	5885eu	7250eu	9645eu
			11740eu 15595eu					
0610	0620	mtwhf	Greece, Voice of	9420eu	11900au	15630eu	17520pa	21530eu
0630	0640	vi	Cameroon, CRTV Radio Buea		6005do			
0630	0700		Finland, YLE/Radio Finland		15315va	21670va		
0630	0700	t h	Georgia, Georgian Radio		6080me			
0630	0700		USA, Voice of America	9530va	9680af	11805af	11965me	15205va
0630	0700	as	USA, Voice of America	5970af	6035af	6080af	7195af	
			11995af 2080af	13670af				
0630	0700		Vatican City, Vatican Radio		11625af	13765af	15570af	
0641	0656		Romania, R Romania International		11775eu	11940na	15180na	15365eu
0645	0655	as	Monaco, Trans World Radio		9870eu			
0655	0700		Monaco, Trans World Radio		9870eu			

## 0700

0700	0705		New Zealand, R New Zealand Int	15340pa				
0700	0720		Swaziland, Trans World Radio		4775af	6035af	9500af	
0700	0727		Czech Rep, Radio Prague Intl		9880eu	11600eu		
0700	0730		Belgium, RVI Flanders R Intl		9865eu			
0700	0730	vi	Papua New Guinea, NBC		9675do	11880irr		
0700	0730		Slovakia, R Slovakia International		9440au	15460au	17550au	
0700	0730		UK, BBC World Service	6190af	9410eu	9740as	11760me	11765af
			11940af 12095eu	15310as	15360as	15400af	15485eu	15565eu
			15575as 17640eu	17760as	17790as	17830af	21660as	
0700	0730	as	UK, BBC World Service	17885af				
0700	0730	a	USA, Voice of America	6873va				

0700	0756		Romania, R Romania International	17735pa				
0700	0800		Anguilla, Caribbean Beacon	6090am				
0700	0800	vi	Australia, ABC/Alice Springs	4835do				
0700	0800	vi	Australia, ABC/Katherine	5025do				
0700	0800	vi	Australia, ABC/Tennant Creek	4910do				
0700	0800		Australia, Christian Voice	17820as	21680pa			
0700	0800		Australia, Radio	9660pa	12080va	15240va	15415as	17580pa
			17750as 21725pa					
0700	0800	vi	Botswana, Radio	7255do	9600do			
0700	0800		Canada, CFRX Toronto ON		6070do			
0700	0800		Canada, CFVP Calgary AB		6030do			
0700	0800		Canada, CHNX Halifax, NS		6130do			
0700	0800		Canada, CKZN St John's NF		6160do			
0700	0800		Canada, CKZU Vancouver BC		6160do			
0700	0800		Costa Rica, R for Peace Intl		7455va	15050va		
0700	0800		Costa Rica, University Network		5030am	6150am	7375am	9724sa
			11870am 13749na	17645as				
0700	0800		Ecuador, HCJB	11680eu	11755pa	21455usb		
0700	0800	mtwhf	Eqt Guinea, Radio Africa		15185af			
0700	0800	as/vl	Eqt. Guinea, Radio East Africa		15185af			
0700	0800	a/monthly	Finland, Scandv Weekend Radio		6170va	11720va		
0700	0800		France R France International		15605af			
0700	0800		Germany, Deutsche Welle		13640eu			
0700	0800		Germany, Overcomer Ministries		9430pa	13810au		
0700	0800	as	Germany, Trans World Radio		12070eu			
0700	0800		Germany, Voice of Hope	5975eu	21590me			
0700	0800	vi	Ghana, Ghana BC Corp		3366do	4915do		
0700	0800		Guyana, Voice of	3289do	5949do			
0700	0800	as/vl	Italy, Italian Radio Relay Service		7120va			
0700	0800		Kenya, Kenya BC Corp		4885irr	4915irr		
0700	0800		Kuwait, Radio		15110as			
0700	0800	vi	Lesotho, Radio		4800do			
0700	0800	vi	Liberia, ELWA		4760do			
0700	0800	vi	Liberia, R Liberia International		5100do			
0700	0800		Malaysia, Radio		7295do			
0700	0800		Malaysia, RTM Sarawak		7160do			
0700	0800		Malaysia, Voice of		6275as	9750as	15295as	
0700	0800		Monaco, Trans World Radio			9870eu		
0700	0800		Myanmar, Radio		9730do			
0700	0800		Namibia, Namibian BC Corp			3270af	3289af	
0700	0800		New Zealand, ZLXA		3935do	7290do		
0700	0800	vi	Nigeria, Radio/Enugu		6025do			
0700	0800	vi	Nigeria, Radio/Ibadan		6050do			
0700	0800	vi	Nigeria, Radio/Kaduna		4770do	6090do	7275do	9570do
0700	0800	vi	Nigeria, Radio/Lagos		3326do	4990do		
0700	0800		Nigeria, Voice of		7255af	11770af	15120na	
0700	0800		Russia, Voice of Russia WS		15490au	17495au	17525au	17635au
			17685au					
0700	0800		Sierra Leone, Sierra Leone BS		3316do			
0700	0800		Singapore, SBC Radio One		6150do			
0700	0800	vi	Solomon Islands, SIBC		5020do	9545do		
0700	0800		Sri Lanka, Sri Lanka BC Corp			3316do		
0700	0800		Taiwan, Radio Taipei International		5950na			
0700	0800		USA, Armed Forces Radio		4278va	4319va	4993va	5765va
			6350va 6458va	6847va	10320va	10940va	12579va	12689va
			13254va 13362va	16847va				
0700	0800		USA, KAU Dallas TX	5755va				
0700	0800		USA, KTN Salt Lake City UT		7510na			
0700	0800		USA, KWHR Naalehu HI	11565pa	17780as			
0700	0800		USA, WEWN Birmingham AL		5825na			
0700	0800		USA, WHRA Greenbush ME		11730af			
0700	0800		USA, WHRI Noblesville IN		5745va	7315am		
0700	0800		USA, WJCR Upton KY	7490am	13595as			
0700	0800		USA, WMLK Bethel PA	9465eu				
0700	0800		USA, WRNO New Orleans LA		7395am			
0700	0800		USA, WSHB Cypress Crk SC		11615af	13650af		
0700	0800		USA, WTJC Newport NC	9370na				
0700	0800		USA, WWCR Nashville TN		3210na	5070na	5935na	7460na
0700	0800	vi	USA, WYFR Okesechoebe FL		7355eu	7460do	15170af	
0700	0800		Vanuatu, Radio		3945do			
0700	0800		Zambia, Christian Voice	9865do				
0700	0800	vi	Zambia, National BC Corp		6165do	6265do		
0700	0800	vi	Zimbabwe, Zimbabwe BC Corp		5975do	6045do		
0705	0710		Croatia, The Voice of Croatia		13820au			
0706	0800		New Zealand, R New Zealand Int		9885pa			
0715	0800		Guam, KTWV/ Trans World R		15200as			
0720	0735	mtwhf	Swaziland, Trans World Radio		4775af	6035af	9500af	
0730	0800		Georgia, Georgian Radio		11910eu			
0730	0800	vi	Papua New Guinea, NBC		4890do	9675irr		
0730	0800		Switzerland, Swiss R International		15545af	17685af	21750af	
0730	0800		UK, BBC World Service	6190af	9410eu	9740as	11760me	11765af
			11940af 12095eu	15310as	15360as	15400af	15485eu	15565af
			17640eu 17760as	17790as	17830af	21660as		
0730	0800	as	UK, BBC World Service	15575as	17885af			
0750	0755as		Greece, Voice of	9420eu	11900au	15630eu	17520as	21530as
0755	0800	mtwhf	Germany, Trans World Radio		12070eu			



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0800	0900	Canada, CFRX Toronto ON	6070do			
0800	0900	Canada, CFVP Calgary AB	6030do			
0800	0900	Canada, CHNX Halifax, NS	6130do			
0800	0900	Canada, CKZN St John's NF	6160do			
0800	0900	Canada, CKZU Vancouver BC	6160do			
0800	0900	Costa Rica, R for Peace Intl	7455va	15050va		
0800	0900	Costa Rica, University Network	5030am	6150am	7375am	9724sa
		11870am 13749na	17645as			
0800	0900	Ecuador, HCJB	11755pa	21455usb		
0800	0900	Eat Guinea, Radio Africa	15185af			
0800	0900	Eat. Guinea, Radio East Africa	15185af			
0800	0900	Finland, Scandv Weekend Radio	6170va	11720va		
0800	0900	Germany, Deutsche Welle	13640eu			
0800	0900	Germany, Overcomer Ministries	13800pa	13810au		
0800	0900	Germany, Trans World Radio	12070eu			
0800	0900	Germany, Voice of Hope 5975eu	21590me			
0800	0900	Ghana, Ghana BC Corp	3366do	4915do		
0800	0900	Guyana, Voice of	3289do	5949do		
0800	0900	Indonesia, Voice of	9525pa			
0800	0900	Italy, Italian Radio Relay Service	7120va	15149pa		
0800	0900	Kenya, Kenya BC Corp	4885irr			
0800	0900	Lesotho, Radio	4800do			
0800	0900	Liberia, ELWA	4760do			
0800	0900	Liberia, R Liberia International	5100do			
0800	0900	Malaysia, Radio	7295do			
0800	0900	Malta, Voice of Mediterranean	11770eu			
0800	0900	Namibia, Namibian BC Corp	7165af	7215af		
0800	0900	Netherlands, Radio	6175na			
0800	0900	New Zealand, R New Zealand Int	9885pa			
0800	0900	New Zealand, ZLXA	3935do	7290do		
0800	0900	Nigeria, Radio/Enugu	6025do			
0800	0900	Nigeria, Radio/Ibadan	6050do			
0800	0900	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0800	0900	Nigeria, Radio/Lagos	3326do			
0800	0900	Nigeria, Voice of	7255af	11770af	15120na	
0800	0900	Papua New Guinea, NBC	4890do	9675irr		
0800	0900	Russia, Voice of Russia WS	15490au	17495au	17525au	17635au
		17685au				
0800	0900	S Africa, Amateur Radio League	9750af	21560af		
0800	0900	Singapore, SBC Radio One	6150do			
0800	0900	Solomon Islands, SIBC	5020do			
0800	0900	South Korea, R Korea Intl	9570am	13670eu		
0800	0900	UK, BBC World Service	6190af	9740as	12095eu	15310as
		15360as 15400af	15485eu	15565eu	17640eu	17760as
		17885af 21470af	21660as	21830as		
0800	0900	UK, BBC World Service	15575as			
0800	0900	USA, Armed Forces Radio	4278va	4319va	4993va	5765va
		6350va 6458va 6847va	10320va	10940va	12579va	12689va
		13254va 13362va 16847va				
		USA, KAIJ Dallas TX	5755va			
0800	0900	USA, KNLS Anchor Point AK	11765as			
0800	0900	USA, KTNB Salt Lake City UT	7510na			
0800	0900	USA, KWHR Naalehu HI	11780as			
0800	0900	USA, Voice of America	11930as	15150as		
0800	0900	USA, WEWN Birmingham AL	5825na			
0800	0900	USA, WHRA Greenbush ME	11730af			
0800	0900	USA, WHRI Noblesville IN	5745va	7315am		
0800	0900	USA, WJCR Upton KY	7490am			
0800	0900	USA, WRNO New Orleans LA	13595as			
0800	0900	USA, WSHB Cypress Crk SC	7395am			
0800	0900	USA, WTJC Newport NC	9845au	9860eu	11615eu	
0800	0900	USA, WWCR Nashville TN	3210na	5070na	5935na	7460na
0800	0900	Vanuatu, Radio	3945do	4960do	7260do	
0800	0900	Zambia, Christian Voice 9865do				
0800	0900	Zambia, National BC Corp	6165do	6265do		
0800	0900	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
0805	0810	Croatia, The Voice of Croatia	13820irr			
0810	0830	Armenia, Voice of	15270eu			
0815	0900	Guam, KTWV/Trans World R	15200as	15330as		
0815	0900	Seychelles, FEBA Radio	15460as			
0830	0900	Australia, ABC/Alice Springs	2310do			
0830	0900	Australia, ABC/Katherine	2485do			
0830	0900	Australia, ABC/Tennant Creek	2325do			
0830	0900	Australia, Radio	5995pa	9710pa	12080va	13605pa 15240va
		15415as 17750as 21725pa				
0830	0900	Austria, AWR Europe	17780af			
0830	0900	Georgia, Georgian Radio	11910me			
0830	0900	Italy/Adv World Radio Europe	9610eu			
0830	0900	Lithuania, Radio Vilnius 9710eu				
0830	0900	Switzerland, Swiss R International	21770af			
0855	0900	Taiwan, CBS	11725as			

## 0900

0900	0915	vi	Ghana, Ghana BC Corp	3366do	4915do	
0900	0929		Czech Rep, Radio Prague Intl	21745as		
0900	0930		Australia, Radio	11880as	15240as	21820as
0900	0930		Guam, KTWV/Trans World R	15330as		
0900	0930		UK, BBC World Service	6190af	6195as	9605as 9740as 11760me
			11940af 11945as 12095eu	15190sa	15310as	15360as 15400af
			15485eu 15565eu 15575as	17640eu	17655as	17760as 17790as
			17830af 17885af 21470af	21660as		
0900	0945		Germany, Deutsche Welle	6160pa	12035af	15410af 15470af
			17715pa 17770pa 17800af	17820as	21560af	21680pa 21790as
0900	1000		Anguilla, Caribbean Beacon	6090am		
0900	1000	vi	Australia, ABC/Alice Springs	2310do		
0900	1000	vi	Australia, ABC/Katherine	2485do		
0900	1000	vi	Australia, ABC/Tennant Creek	2325do		
0900	1000	vi	Botswana, Radio	7255do	9600do	
0900	1000		Canada, CFRX Toronto ON	6070do		
0900	1000		Canada, CFVP Calgary AB	6030do		
0900	1000		Canada, CHNX Halifax, NS	6130do		
0900	1000		Canada, CKZN St John's NF	6160do		

0900	1000		Canada, CKZU Vancouver BC	6160do		
0900	1000		China China Radio International	11730pa	15210pa	
0900	1000		Costa Rica, R for Peace Intl	7455va	15050va	
0900	1000		Costa Rica, University Network	5030am	6150am	7375am 9724sa
			11870am 13749na 17645as			
0900	1000		Ecuador, HCJB	11775pa	21455usb	
0900	1000	mtwhf	Eat Guinea, Radio Africa	15185af		
0900	1000	as/vl	Eat. Guinea, Radio East Africa	15185af		
0900	1000	a/monthly	Finland, Scandv Weekend Radio	6170va	11720va	
0900	1000	a	Germany, Good News World R	5985eu	5995eu	
0900	1000		Germany, Overcomer Ministries	13800pa	13810au	
0900	1000		Germany, Trans World Radio	12070eu		
0900	1000		Germany, Voice of Hope 5975eu	21590me		
0900	1000		Guyana, Voice of	3289do	5949do	
0900	1000	as/vl	Italy, Italian Radio Relay Service	7120va		
0900	1000		Kenya, Kenya BC Corp	4885irr	4915irr	
0900	1000	vi	Lesotho, Radio	4800do		
0900	1000	vi	Liberia, ELWA	4760do		
0900	1000	vi	Liberia, R Liberia International	5100do		
0900	1000		Malaysia, Radio	7295do		
0900	1000		Namibia, Namibian BC Corp	7165af	7215af	
0900	1000		New Zealand, R New Zealand Int	9885pa		
0900	1000		New Zealand, ZLXA	3935do	7290do	
0900	1000	vi	Nigeria, Radio/Enugu	6025do		
0900	1000	vi	Nigeria, Radio/Ibadan	6050do		
0900	1000	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do 9570do
0900	1000	vi	Nigeria, Radio/Lagos	3326do		
0900	1000		Nigeria, Voice of	7255af	11770af	15120na
0900	1000		Papua New Guinea, NBC	4890do	9675irr	
0900	1000		Russia, Voice of Russia WS	15490au	17495au	17525au 17635au
			17685au			
0900	1000		S Africa, Amateur Radio League	9750af	21560af	
0900	1000		Singapore, SBC Radio One	6150do		
0900	1000	vi	Solomon Islands, SIBC	5020do		
0900	1000		South Korea, R Korea Intl	9570am	13670eu	
0900	1000		UK, BBC World Service	6190af	9740as	12095eu 15310as
			15360as 15400af	15485eu	15565eu	17640eu 17760as 17830af
			17885af 21470af	21660as		
0900	1000	as	UK, BBC World Service	15575as		
0900	1000		USA, Armed Forces Radio	4278va	4319va	4993va 5765va
			6350va 6458va 6847va	10320va	10940va	12579va 12689va
			13254va 13362va 16847va			
			USA, KAIJ Dallas TX	5755va		
0900	1000		USA, KTNB Salt Lake City UT	7510na		
0900	1000		USA, KWHR Naalehu HI	11780as		
0900	1000		USA, Voice of America	11930as	13610as	15150as
0900	1000		USA, WEWN Birmingham AL	5825na		
0900	1000		USA, WHRA Greenbush ME	11730af		
0900	1000		USA, WHRI Noblesville IN	5745va	7315am	
0900	1000		USA, WJCR Upton KY	7490am		
0900	1000		USA, WRMI Miami FL	9955am		
0900	1000	mtwhfa	USA, WSHB Cypress Crk SC	9455eu	9860eu	11615eu
0900	1000		USA, WTJC Newport NC	9370na		
0900	1000		USA, WWCR Nashville TN	2390na	5070na	5935na 9475na
0900	1000	vi	Vanuatu, Radio	3945do	4960do	7260do
0900	1000	mt hfa	Vatican City, Vatican Radio	5885eu		
0900	1000		Zambia, Christian Voice 9865do			
0900	1000	vi	Zambia, National BC Corp	6165do	6265do	
0900	1000	vi	Zimbabwe, Zimbabwe BC Corp	5975do	6045do	
0910	0920		Greece, Voice of	12105eu		
0915	1000		Ghana, Ghana BC Corp	6130do	4915do	
0915	1000	vi/as	Ghana, Ghana BC Corp	4915do		
0930	1000		Australia, Radio	11880as	13605pa	15240as 17750as 21820as
0930	1000		Netherlands, Radio	9790as	12065as	13710as
0930	1000		UK, BBC World Service	6190af	6195as	9740as 11760me 11940af
			12095eu 15190as 15310as	15360as	15400af	15485eu 15565eu
			15575as 17640eu 17760as	17790as	17830af	17885af 21470af
			21660as			
0945	1000		Germany, Deutsche Welle	13640eu		

## 1000

1000	1027		Vietnam, Voice of	12019as	15115as			
1000	1030		Guam, KSDA/ Adventist World R		11560as	11705as		
1000	1030		Netherlands, Radio	9790as	12065as	13710as		
1000	1030		Palau, KHBN/Voice of Hope		15725as			
1000	1030		Singapore, RTE Radio	11685au				
1000	1030		Sri Lanka, Sri Lanka BC Corp		4940do			
1000	1030		UK, BBC World Service	6190af	6195va	9740as	11760me	11940af
			12095eu 15310as 15360as		15485eu	15565eu	15575as	17640eu
			17760as 17790as 17885af		21470af	21660as		
1000	1030	as	UK, BBC World Service	15190as	15400af	17830af		
1000	1100		Anguilla, Caribbean Beacon		11775am			
1000	1100	vi	Australia, ABC/Alice Springs		2310do			
1000	1100	vi	Australia, ABC/Katherine		2485do			
1000	1100	vi	Australia, ABC/Tennant Creek		2325do			
1000	1100		Australia, Radio	11880as	13605pa	15240as	17750as	21820as
1000	1100	as	Bhutan, Bhutan BC Service		6035do			
1000	1100	vi	Botswana, Radio	7255do	9600do			
1000	1100		Canada, CFRX Toronto ON		6070do			
1000	1100		Canada, CFVP Calgary AB		6030do			
1000	1100		Canada, CHNX Halifax, NS		6130do			
1000	1100		Canada, CKZN St John's NF		6160do			
1000	1100		Canada, CKZU Vancouver BC		6160do			
1000	1100		China China Radio International		11730pa	15210pa		
1000	1100		Costa Rica, R for Peace Intl		15050va			
1000	1100		Costa Rica, University Network		5030am	6150am	7375am	9724sa
			11870am 13749na 17645as					
1000	1100		Ecuador, HCJB	11755pa	21455usb			
1000	1100	mtwhf	Eqt Guinea, Radio Africa		15185af			
1000	1100	as/vl	Eqt. Guinea, Radio East Africa		15185af			
1000	1100	a/monthly	Finland, Scandy Weekend Radio		6170va	11720va		
1000	1100		Germany, Deutsche Welle		13640eu			
1000	1100	s	Germany, Sunshine Radio		6015eu			
1000	1100		Germany, Voice of Hope	21590me				
1000	1100	vi	Ghana, Ghana BC Corp		6130do			
1000	1100	vi/as	Ghana, Ghana BC Corp		4915do			
1000	1100		Guyana, Voice of	5949do				
1000	1100		India, All India Radio	11585as	13700au	15020as	15770au	17845au
			17840au 17895au					

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1000	1100	as/vl	Italy, Italian Radio Relay Service	7120va				
1000	1100		Japan, Radio	15590as	21755pa			
1000	1100		Kenya, Kenya BC Corp	4885irr				
1000	1100	vl	Lesotho, Radio	4800do				
1000	1100	vl	Liberia, ELWA	4760do				
1000	1100	vl	Liberia, R Liberia International	6100do				
1000	1100		Malaysia, Radio	7295do				
1000	1100		Namibia, Namibian BC Corp	7165af	7215af			
1000	1100		New Zealand, R New Zealand Int	9885pa				
1000	1100		New Zealand, ZLXA	3935do				
1000	1100	vl	Nigeria, Radio/Enugu	6025do				
1000	1100	vl	Nigeria, Radio/Ibadan	6050do				
1000	1100	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1000	1100	vl	Nigeria, Radio/Lagos	4990do	7285do			
1000	1100	vl	Papua New Guinea, NBC	4890do	9675irr			
1000	1100		Singapore, SBC Radio One	6150do				
1000	1100	vl	Solomon Islands, SIBC	5020do				
1000	1100		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
			6350va 6458va 6847va	10320va	10940va	12579va	12689va	
			13254va 13362va 16847va					
1000	1100		USA, KAIJ Dallas TX	5755va				
1000	1100		USA, KTBN Salt Lake City UT	7510na				
1000	1100		USA, KWHR Naalehu HI	9930as	11565pa			
1000	1100		USA, Voice of America	5745am	9590am	9770pa	15240as	
			15425as					
1000	1100		USA, WEWN Birmingham AL	7425na	15745eu			
1000	1100		USA, WHRI Noblesville IN	6040na	9495am			
1000	1100		USA, WJCR Upton KY	7490am	13595as			
1000	1100	mtwhfa	USA, WRMI Miami FL	9955am				
1000	1100		USA, WRNO New Orleans LA	7395am				
1000	1100		USA, WSHB Cypress Crk SC	6095am	9455sa	11870as		
1000	1100		USA, WTJC Newport NC	9370na				
1000	1100		USA, WWCR Nashville TN	5070na	5935na	7435na	9475na	
1000	1100		USA, WYFR Okeechobee FL	5950na				
1000	1100	vl	Vanuatu, Radio	3945do	4960do	7260do		
1000	1100		Zambia, Christian Voice	9865do				
1000	1100	vl	Zambia, National BC Corp	6165do	6265do			
1000	1100	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			
10000	1030		Switzerland, Swiss R International	15315eu				
1030	1035		Israel, Kol Israel	15640va	17545va			
1030	1045	mtwhf	Ethiopia, Radio	5990do	7110do	9705do		
1030	1100		Guam, KSDA/Adventist World R	11560as				
1030	1100		Malaysia, RTM Sarawak	7160do				
1030	1100		Mongolia, Voice of	12085au				
1030	1100		Netherlands, Radio	5965na	6045eu	9760as	9860eu	12065as
			13710as					
1030	1100		Palau, KHBN/Voice of Hope	9965as	15725as			
1030	1100		Sri Lanka, Sri Lanka BC Corp	4940do	11835as	15120as	17850as	
1030	1100		UAE, Radio Dubai	13675eu	15370eu	15395eu		
1030	1100		UK, BBC World Service	6190af	6195va	9740as	11760me	11940af
			12095eu 15310as 15485eu	15565eu	15575as	17640eu	17790as	
			17885af 21470af					

## 1100

1100	1105		New Zealand, R New Zealand Int	9885pa				
1100	1130		Pakistan, Radio	17520eu	21465eu			
1100	1120	fa	Kazakhstan, Radio Almaty	9620eu	11840eu			
1100	1127		Vietnam, Voice of	7285as				
1100	1130		Australia, Radio	5995pa	6020pa	9475as	9580va	11650pa
			11880as 12080va 13605va	15240as	21820as			
1100	1130		Netherlands, Radio	5965na	6045eu	9760as	9860eu	12065as
			13710as					
1100	1130		Sri Lanka, Sri Lanka BC Corp	4940do	11835as	15210as	17850as	
1100	1130	mtwhf	UK, BBC Caribbean Report	6195ca	15220ca			
1100	1130		UK, BBC World Service	6190af	6195as	9740as	9815as	11760me
			11940af 11955as 12095eu	15280as	15310as	15400af	15485eu	
			15565eu 15575as 17640eu	17700as	17790sa	17830af	17885af	
			21470af					
1100	1130	as	UK, BBC World Service	6195am	15190sa	15220am		
1100	1130		Ukraine, R Ukraine International	12040eu	15135na			
1100	1145		Germany, Deutsche Welle	11785af	15410af	17860af	21780af	
1100	1200		Anguilla, Caribbean Beacon	11775am				
1100	1200	vl	Australia, ABC/Alice Springs	2310do				
1100	1200	vl	Australia, ABC/Katherine	2485do				
1100	1200	vl	Australia, ABC/Tennant Creek	2325do				
1100	1200	vl	Botswana, Radio	7255do	9600do			
1100	1200		Bulgaria, Radio	17500eu				
1100	1200		Canada, CBC Northern Service	9625do				
1100	1200		Canada, CFRX Toronto ON	6070do				
1100	1200		Canada, CFVP Calgary AB	6030do				
1100	1200		Canada, CHNX Halifax, NS	6130do				
1100	1200		Canada, CKZN St John's NF	6160do				
1100	1200		Canada, CKZU Vancouver BC	6160do				
1100	1200		Costa Rica, R for Peace Intl	15050va				
1100	1200		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
			11870am 13749na 17645as					
1100	1200		Ecuador, HCJB	12005am	15115am	21455usb		
1100	1200	mtwhf	Eqt Guinea, Radio Africa	15185af				
1100	1200	as/vl	Eqt. Guinea, Radio East Africa	15185af				
1100	1200	a/monthly	Finland, Scandv Weekend Radio	6170va	11720va			
1100	1200	s	Germany, Sunshine Radio	6015eu				
1100	1200		Germany, Voice of Hope	21590me				
1100	1200	vl	Ghana, Ghana BC Corp	6130do				
1100	1200	vl/as	Ghana, Ghana BC Corp	4915do				
1100	1200		Guyana, Voice of	5949do				
1100	1200		Iran, Voice of Islamic Rep. of Iran	15385as	15430as	15585as	21470as	
			21730as					
1100	1200	as/vl	Italy, Italian Radio Relay Service	7120va				
1100	1200		Japan, Radio	9695pa	15590as			
1100	1200		Kenya, Kenya BC Corp	4885irr				
1100	1200	vl	Lesotho, Radio	4800do				

1100	1200	vl	Liberia, ELWA	4760do				
1100	1200	vl	Liberia, R Liberia International	6100do				
1100	1200		Malaysia, Radio	7295do				
1100	1200		Malaysia, TRM Sarawak	7160do				
1100	1200		Namibia, Namibian BC Corp	7165af	7215af			
1100	1200		New Zealand, ZLXA	3935do				
1100	1200	vl	Nigeria, Radio/Enugu	6025do				
1100	1200	vl	Nigeria, Radio/Ibadan	6050do				
1100	1200	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1100	1200	vl	Nigeria, Radio/Lagos	4990do	7285do			
1100	1200		Palau, KHBN/Voice of Hope	9965as				
1100	1200	vl	Papua New Guinea, NBC	4890do				
1100	1200		Singapore, R Singapore Intl	6150as	9600as			
1100	1200		Switzerland, Swiss R International	13735as	21770as			
1100	1200		Taiwan, Radio Taipei International	7445as	11905as			
1100	1200		Taiwan, Voice of Asia	7445as				
1100	1200		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
			6350va 6458va 6847va	10320va	10940va	12579va	12689va	
			13254va 13362va 16847va					
1100	1200		USA, KAIJ Dallas TX	5755va				
1100	1200		USA, KTBN Salt Lake City UT	7510na				
1100	1200		USA, KWHR Naalehu HI	9930as	11565pa			
1100	1200		USA, Voice of America	6160as	9645as	9760as	9770pa	15160as
			15240as 15425as					
1100	1200		USA, WEWN Birmingham AL	7425na	15745eu			
1100	1200		USA, WHRI Noblesville IN	6040na	9495am			
1100	1200	a s	USA, WINB Red Lion PA	13750am				
1100	1200		USA, WJCR Upton KY	7490am	13595as			
1100	1200	mtwhfa	USA, WRMI Miami FL	9955am				
1100	1200		USA, WRNO New Orleans LA	7395am				
1100	1200		USA, WSHB Cypress Crk SC	6095am	9455am	11590am	11660am	
1100	1200		USA, WTJC Newport NC	9370na				
1100	1200		USA, WWCR Nashville TN	5070na	5935na	7435na	15685na	
1100	1200		USA, WYFR Okeechobee FL	5850na	5950na			
1100	1200	vl/s	Vanuatu, Radio	3945do	4960do	7260do		
1100	1200		Zambia, Christian Voice	9865do				
1100	1200	vl	Zambia, National BC Corp	6165do	6265do			
1100	1200	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			
1106	1200		New Zealand, R New Zealand Int	11675as				
1115	1145		Nepal, Radio 5005as	7165as				
1120	1140	w	Kazakhstan, Radio Almaty	9620eu	11840eu			
1130	1145	vl	Libya, Voice of Africa	11815af	15435af	17725af		
1130	1200		Australia, Radio	5995pa	6020pa	9475as	9580va	11650pa
			11880as 12080va 13605va	15240as	21820as			
1130	1200	a	Austria, R Austria International	6155eu	13730eu			
1130	1200		Belgium, RVI Flanders R Intl	9865as	9925eu			
1130	1200		Netherlands, Radio	5965na	6045eu	9760as	9860eu	12065as
			13710as					
1130	1200		South Korea, R Korea Intl	9650na				
1130	1200		Sri Lanka, Sri Lanka BC Corp	4940do				
1130	1200		Sweden, Radio	17505as	18960na			
1130	1200		UK, BBC World Service	6190af	6195as	9740as	9815as	11760me
			11940af 11955as 12095eu	15220am	15280as	15310as	15485eu	15565eu
			15575as 17640eu 17700as	17830af	17885af	21470af		
1130	1200		Ukraine, R Ukraine International	15135na				
1130	1200	f	Vatican City, Vatican Radio	15595va	17515va			
1140	1200	t	Kazakhstan, Radio Almaty	9620eu	11840eu			
1145	1200		Germany, Deutsche Welle	13640eu				

## 1200

1200	1220	mtwhf	UK, BBC Caribbean Report	6195ca	15220ca				
1200	1220		UK, BBC World Service	6190af	6195as	9740as	9815as	11760me	
			11940af 11955as 12095eu	15280as	15310as	15485eu	15565eu		
			15575as 17640eu 17700as	17830af	17885af	21470af			
1200	1220	as	UK, BBC World Service	6195am	15220am				
1200	1225		Netherlands, Radio	5965na	9860eu				
1200	1230		France R France International	15540eu	25820af				
1200	1230		Iran, Voice of Islamic Rep. of Iran	15385as	15430as	15585as	21470as		
			21730as						
1200	1230		Philippines, FEBC	15110as					
1200	1230		Sri Lanka, Sri Lanka BC Corp	4940do					
1200	1230		Switzerland, Swiss R International	15315eu					
1200	1230		Uzbekistan, Radio Tashkent	7285as	9715as	15295as	17775as		
1200	1245		USA, WYFR Okeechobee FL	5850na	5950na	17750na			
1200	1255		Poland, Radio Polonia	6095eu	7270eu	9525eu	11820eu		
1200	1256		North Korea, Voice of Korea	3560va	9640va	9850va	9975va		
			11334va 13650va						
1200	1300		Anguilla, Caribbean Beacon	11775am					
1200	1300	vl	Australia, ABC/Alice Springs	2310do					
1200	1300		Australia, ABC/Katherine	2485do					
1200	1300	vl	Australia, ABC/Tennant Creek	2325do					
1200	1300		Australia, Radio	5995pa	6020pa	9475as	9580as	11650va	
			11880as 21820as						
1200	1300		Bangladesh, Bangla Betar	7185as	9550as				
1200	1300	vl	Botswana, Radio	7255do	9600do				
1200	1300		Canada, CBC Northern Service	9625do					
1200	1300		Canada, CFRX Toronto ON	6070do					
1200	1300		Canada, CFVP Calgary AB	6030do					
1200	1300		Canada, CHNX Halifax, NS	6130do					
1200	1300		Canada, CKZN St John's NF	6160do					
1200	1300		Canada, CKZU Vancouver BC	6160do					
1200	1300		Canada, R Canada International	9660as	15190as				
1200	1300		mtwhf	Canada, R Canada International	9640am	15305am	17820am		
1200	1300			China China Radio International	9730as	9760pa	11675pa	11980as	
				15415pa					
1200	1300			Costa Rica, R for Peace Intl	21815usb				
1200	1300			Costa Rica, University Network	5030am	6150am	7375am	9724sa	
				11870am 13749na 17645as					
1200	1300		Ecuador, HCBJ	12005am	15115am	21455usb			
1200	1300	as/vl a/monthly	Eqt. Guinea, Radio East Africa	15185af					
1200	1300		Finland, Scandv Weekend Radio	6170va	11720va				
1200	1300		Germany, Deutsche Welle	13640eu					

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1200	1300	s	Germany, Sunshine Radio	6015eu				
1200	1300		Germany, Voice of Hope 15715me					
1200	1300	vl	Ghana, Ghana BC Corp	4915do	6130do			
1200	1300		Guyana, Voice of	5949do				
1200	1300	as/vl	Italy, Italian Radio Relay Service	7120va				
1200	1300		Kenya, Kenya BC Corp	4885irr				
1200	1300	vl	Lesotho, Radio	4800do				
1200	1300	vl	Liberia, ELWA	4760do				
1200	1300	vl	Liberia, R Liberia International	6100do				
1200	1300		Malaysia, Radio	7295do				
1200	1300		Namibia, Namibian BC Corp	7165af	7215af			
1200	1300		Netherlands, Radio	9515na				
1200	1300		New Zealand, R New Zealand Int	11675sas				
1200	1300		New Zealand, ZLXA	3935do				
1200	1300	vl	Nigeria, Radio/Enugu	6025do				
1200	1300	vl	Nigeria, Radio/Ibadan	6050do				
1200	1300	vl	Nigeria, Radio/Kaduna	4770do				
1200	1300	vl	Nigeria, Radio/Lagos	4990do				
1200	1300		Palau, KHBN/Voice of Hope	9965as				
1200	1300	vl	Papua New Guinea, NBC	4890do	9675irr			
1200	1300		Singapore, R Singapore Intl	6150as	9600as			
1200	1300		Taiwan, Radio Taipei International	7130as	9610au			
1200	1300		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
1200	1300			6350va	6458va	6847va	10320va	
1200	1300			13254va	13362va	16847va		
1200	1300		USA, KAUJ Dallas TX	13815va				
1200	1300		USA, KLTN Salt Lake City UT	7510na				
1200	1300		USA, KWHR Naalehu HI	11565pa				
1200	1300		USA, Voice of America	6160as	9645as	9760as	15160as	15240as
1200	1300			1542sas				
1200	1300		USA, WEWN Birmingham AL	7425na	15745eu			
1200	1300		USA, WHRI Noblesville IN	6040na	9495am			
1200	1300		USA, WINB Red Lion PA	13570am				
1200	1300		USA, WJCR Upton KY	7490am	13595as			
1200	1300	mtwhfa	USA, WRMI Miami FL	15724na				
1200	1300	s	USA, WRMI Miami FL	9955am				
1200	1300		USA, WRNO New Orleans LA	7395am				
1200	1300		USA, WSHB Cypress Crk SC	6095am	9455am	9875as	11590am	
1200	1300			12065am	11660as	17635as		
1200	1300		USA, WTJC Newport NC	9370na				
1200	1300		USA, WWCR Nashville TN	7435na	12160na	13845na	15685na	
1200	1300		USA, WWFV McCaysville GA	12172va				
1200	1300	vl/s	Vanuatu, Radio	3945do	4960do	7260do		
1200	1300		Zambia, Christian Voice	9865do				
1200	1300	vl	Zambia, National BC Corp	6165do	6265do			
1200	1300	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			
1215	1300		Egypt, Radio Cairo	17595as				
1220	1300		UK, BBC World Service	6190af	6195as	9740as	9815as	11760me
				11940af	11955as	12095eu	15280as	15310as
				15565eu	15575as	17640eu	17780af	17885af
1230	1257		Vietnam, Voice of	12019as	15115as			
1230	1300		Finland, YLE/Radio Finland	15400na	17670na			
1230	1300		Germany, Overcomer Ministries	6110eu				
1230	1300		Italy/Adv World Radio Europe	9610eu				
1230	1300		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as	
				1542sas				
1230	1300		Sweden, Radio	17505as	18960na	21530as		
1230	1300		Thailand, Radio	9885va				
1230	1300		Turkey, Voice of	17810as	17830eu			
1230	1300	a	UK, Wales Radio Int/Merlin	17810au				
1245	1300	a	Seychelles, FEBA Radio	15535me				
1245	1300		USA, WYFR Okeechobee FL	17750na				
1255	1300	mtwhfa	Taiwan, CBS	6180as	7250as	9630as	11725as	11775as

## 1300

1300	1305		New Zealand, R New Zealand Int	11675as				
1300	1329		Czech Rep, Radio Prague Intl	13580eu	21745as			
1300	1330		Australia, Radio	5995pa	6020pa	9475as	9580va	11650va
				11880as	21820as			
1300	1330		Egypt, Radio Cairo	17595as				
1300	1330	s	Germany, Universal Life	9955na				
1300	1330		Guam, KSDA/ Adventist World R	15385as				
1300	1330		Turkey, Voice of	17830eu				
1300	1400		Anguilla, Caribbean Beacon	11775am				
1300	1400	vl	Australia, ABC/Alice Springs	2310do				
1300	1400	vl	Australia, ABC/Katherine	2485do				
1300	1400	vl	Australia, ABC/Tennant Creek	2325do				
1300	1400	vl	Botswana, Radio	9600do				
1300	1400		Canada, CBC Northern Service	9625do				
1300	1400		Canada, CFRX Toronto ON	6070do				
1300	1400		Canada, CFVP Calgary AB	6030do				
1300	1400		Canada, CHNX Halifax, NS	6130do				
1300	1400		Canada, CKZN St John's NF	6160do				
1300	1400		Canada, CKZU Vancouver BC	6160do				
1300	1400		Canada, R Canada International	9640am	15305am			
1300	1400	mtwhf	Canada, R Canada International	17820am				
1300	1400	as	Canada, R Canada International	17800am				
1300	1400		China China Radio International	7405na	9570na	11675pa	11900pa	
				11980as	15180as			
1300	1400		China, Voice of Hope	13820as				
1300	1400		Costa Rica, R for Peace Intl	15050va	21815usb			
1300	1400		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
				11870am	13749na	17645as		
1300	1400		Ecuador, HCJB	12005am	15115am	21455usb		
1300	1400	as/vl	Egt. Guinea, Radio East Africa	15185af				
1300	1400	a/monthly	Finland, Scandv Weekend Radio	6170va	11720va			
1300	1400		Germany, Deutsche Welle	13640eu				
1300	1400		Germany, Overcomer Ministries	6110eu	13810af			
1300	1400	s	Germany, Sunshine Radio	6015eu				
1300	1400		Germany, Voice of Hope 15715me					
1300	1400	vl	Ghana, Ghana BC Corp	4915do	6130do			
1300	1400		Guyana, Voice of	5949do				

1300	1400	as/vl	Italy, Italian Radio Relay Service	7120va				
1300	1400		Jordan, Radio	11690eu				
1300	1400		Kenya, Kenya BC Corp	4885irr	4915irr			
1300	1400	vl	Lesotho, Radio	4800do				
1300	1400	vl	Liberia, ELWA	4760do				
1300	1400	vl	Liberia, R Liberia International	6100do				
1300	1400		Malaysia, Radio	7295do				
1300	1400		Namibia, Namibian BC Corp	7165af	7215af			
1300	1400		Netherlands, Radio	9515na	11865na			
1300	1400		New Zealand, ZLXA	3935do				
1300	1400	vl	Nigeria, Radio/Enugu	6025do				
1300	1400	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1300	1400	vl	Nigeria, Radio/Lagos	4990do	7285do			
1300	1400	vl	Palau, KHBN/Voice of Hope	9965as				
1300	1400	as	Papua New Guinea, NBC	4890do	9675irr			
1300	1400		S Africa, Channel Africa	11720af	17780af	21725af		
1300	1400		Singapore, R Singapore Intl	6150as	9600as			
1300	1400		South Korea, R Korea Intl	9570as	13670om			
1300	1400		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as	
				15425as				
1300	1400		Uganda, Radio	7196do				
1300	1400		UK, BBC World Service	6190af	9740as	9815as	11760me	11940af
				12095eu	15220am	15310as	15485eu	15575me
				17640eu	17700as	17830af	21470af	
1300	1400		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
				6350va	6458va	6847va	10320va	
				13254va	13362va	16847va		
			USA, KAUJ Dallas TX	13815va				
			USA, KJES Vado NM	11715na				
1300	1400		USA, KNLS Anchor Point AK	11870as				
1300	1400		USA, KLTN Salt Lake City UT	7510na				
1300	1400		USA, KWHR Naalehu HI	11565pa				
1300	1400	a	USA, Voice of America	6160as	9645as	9760as	15160as	15425as
1300	1400		USA, WBCQ Monticello ME	17495na				
1300	1400		USA, WEWN Birmingham AL	11875na				
1300	1400		USA, WHRI Noblesville IN	6040na	15105am			
1300	1400		USA, WINB Red Lion PA	13570am				
1300	1400		USA, WJCR Upton KY	7490am	13595as			
1300	1400	mtwhfa	USA, WRMI Miami FL	15724na				
1300	1400	s	USA, WRMI Miami FL	9955am				
1300	1400		USA, WRNO New Orleans LA	7395am				
1300	1400		USA, WSHB Cypress Crk SC	9430na	9455am	9940as		
1300	1400		USA, WTJC Newport NC	9370na				
1300	1400		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
1300	1400		USA, WWFV McCaysville GA	12172va				
1300	1400		USA, WYFR Okeechobee FL	11550as	11830na	11970na	17750na	
1300	1400		Zambia, Christian Voice	9865do				
1300	1400	vl	Zambia, National BC Corp	6165do	6265do			
1300	1400	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			
1305	1400	occnsal	New Zealand, R New Zealand Int	6095pa				
1325	1400		Germany, Voice of Hope	17550as				
1330	1357		Vietnam, Voice of	9730eu	11630eu	13740eu		
1330	1400		Australia, Radio	5995pa	6020pa	9475as	9580va	11650va
				11660as	21820as			
1330	1400	s	Austria, R Austria International	6155eu	13730eu	21789as		
1330	1400		Guam, KSDA/ Adventist World R	11705as	11980as			
1330	1400		India, All India Radio	9690as	11620as	13710as		
1330	1400		Sweden, Radio	17505va	18960na			
1330	1400		UAE, Radio Dubai	13630eu	13675eu	15395eu	21605eu	
1330	1400		UK, BBC World Service	6190af	6195va	9740as	9815as	11760me
				11940af	12095eu	15220am	15310as	15420af
				15575me	17640eu	17700as	17830af	21470af
1330	1400		Uzbekistan, Radio Tashkent	7285as	9715as	15295as	17775as	

## 1400

1400	1430		Ecuador, HCJB	12005am	15115am	21455usb		
1400	1430		Guam, KSDA/ Adventist World R	17720as				
1400	1430		Thailand, Radio	9830as				
1400	1430	as	UK, BBC World Service	15245as				
1400	1430	s	USA, Voice of America	18275va				
1400	1456		Romania, R Romania International	15250eu	17735eu			
1400	1500		Anguilla, Caribbean Beacon	11775am				
1400	1500	vl	Australia, ABC/Alice Springs	2310do				
1400	1500	vl	Australia, ABC/Katherine	2485do				
1400	1500	vl	Australia, ABC/Tennant Creek	2325do				
1400	1500		Australia, Radio	5995va	9580va	11660as		
1400	1500	vl	Botswana, Radio	7255do	9600do			
1400	1500	vl	Cameroon, CRTV Radio Buea	6005do				
1400	1500		Canada, CBC Northern Service	9625do				
1400	1500		Canada, CFRX Toronto ON	6070do				
1400	1500		Canada, CFVP Calgary AB	6030do				
1400	1500		Canada, CHNX Halifax, NS	6130do				
1400	1500		Canada, CKZN St John's NF	6160do				
1400	1500		Canada, CKZU Vancouver BC	6160do				
1400	1500		Canada, R Canada International	9640am	15305am			
1400	1500	mtwhf	Canada, R Canada International	17820am				
1400	1500	as	Canada, R Canada International	17800am				
1400	1500		China China Radio International	7180as	7405na	9700as	11675as	
			11765as 13685af 15125af					
1400	1500		China, Voice of Hope	13820as				
1400	1500		Costa Rica, R for Peace Intl	15050va	21815usb			
1400	1500		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
			11870am 13749na 17645as					
1400	1500	as/vl	Eqt. Guinea, Radio East Africa	15185af				
1400	1500	a/monthly	Finland, Scandy Weekend Radio	6170va	11720va			
1400	1500		France R France International	11610me	17620as			
1400	1500		Germany, Deutsche Welle	13640eu				
1400	1500	as	Germany, Overcomer Ministries	17490eu				
1400	1500		Germany, Overcomer Ministries	6110eu	13810af			
1400	1500		Germany, Voice of Hope 15715me	17550as				
1400	1500	vl	Ghana, Ghana BC Corp	4915do	6130do			
1400	1500		Gwanna Voice of	5949do				



# Shortwave Guide



1400	1500		India, All India Radio	9690as	11620as	13710as	
1400	1500	as/vl	Italy, Italian Radio Relay Service	7120va			
1400	1500		Japan, Radio	7200pa	9505na	11730as	17755me
1400	1500		Jordan, Radio	11690na	17680al		
1400	1500		Kenya, Kenya BC Corp	4885irr	4915irr		
1400	1500	vl	Lesotho, Radio	4800do			
1400	1500	vl	Liberia, ELWA	4760do			
1400	1500	vl	Liberia, R Liberia International		6100do		
1400	1500		Malaysia, Radio	7295do			
1400	1500		Malaysia, RTM Sarawak	7160do			
1400	1500		Namibia, Namibian BC Corp		7165af	7215af	
1400	1500		Netherlands, Radio	9515na	11865na	15220na	
1400	1500	occsnal	New Zealand, R New Zealand Int		6095pa		
1400	1500		New Zealand, ZLXA	3935do			
1400	1500	vl	Nigeria, Radio/Enugu	6025do			
1400	1500	vl	Nigeria, Radio/Ibadan	6050do	6090do	7275do	9570do
1400	1500	vl	Nigeria, Radio/Kaduna	4770do			
1400	1500	vl	Nigeria, Radio/Lagos	4990do	7285do		
1400	1500		Oman, Radio Sultanate of	15140va			
1400	1500		Palau, KHBN/Voice of Hope	9965as			
1400	1500		Russia, Voice of Russia WS	9745as	12055as	15560as	
1400	1500	as	S Africa, Channel Africa	11720af	17780af	21725af	
1400	1500		Singapore, SBC Radio One	6150do			
1400	1500		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as
			15425as				
1400	1500		Switzerland, Swiss R International	9575as	17680as		
1400	1500		Taiwan, Radio Taipei International	15265as			
1400	1500		Uganda, Radio	7196do			
1400	1500		UK, BBC World Service	6190af	6195as	9740as	9815as
			12095eu	15310as	15485eu	15575me	11940af
			17830af	17840am	21470af	17640eu	17700as
1400	1500		USA, Armed Forces Radio		21660af		
			6350va	6458va	6847va	4319va	4993va
			13254va	13362va	16847va	10940va	12579va
1400	1500		USA, KAUJ Dallas TX	13815va			
1400	1500		USA, KJES Vado NM	11715na			
1400	1500		USA, KTNB Salt Lake City UT		7510na		
1400	1500		USA, KWHR Naalehu HI	9930as	11565pa		
1400	1500		USA, Voice of America	6160as	9645as	9760as	15160as
			15255va	15425as			
1400	1500		USA, WBCQ Monticello ME		17494na		
1400	1500		USA, WEWN Birmingham AL		11875na		
1400	1500		USA, WHRI Noblesville IN		6040na	15105am	
1400	1500		USA, WINB Red Lion PA	13750am			
1400	1500		USA, WJCR Upton KY	7490am	13595as		
1400	1500	mtwhfa	USA, WRMI Miami FL	15724na			
1400	1500	s	USA, WRMI Miami FL	9955am			
1400	1500		USA, WRNO New Orleans LA		7395am		
1400	1500		USA, WTJC Newport NC	9370na			
1400	1500		USA, WWCR Nashville TN		9475na	12160na	13845na
1400	1500		USA, WWFV McCaysville GA		12172va		15685na
1400	1500		USA, WYFR Okeechobee FL		11550as	11830na	11970na
1400	1500		Zambia, Christian Voice	9865do			17750na
1400	1500	vl	Zambia, National BC Corp		6165do	6265do	
1400	1500	vl	Zimbabwe, Zimbabwe BC Corp		5975do	6045do	
1415	1420		Nepal, Radio 5005as	7165as			
1430	1500		Guam, KTWR/ Trans World R		15330as		
1430	1500		Malaysia, RTM Kota Kinabalu		5980do		
1430	1500		Myanmar, Radio		5985do		
1430	1500		Netherlands, Radio		9890as	11835as	12075as
1445	1500	f	Seychelles, FEBA Radio		11600as		

## 1500

1500	1530		Australia, Radio	5995va	9580va	11650va	11660as
1500	1530		Germany, Voice of Hope	17550as			
1500	1530		Mexico, R Mexico International		9705am	11770am	
1500	1530		Mongolia, Voice of	12015as	12085as		
1500	1530		S Africa, Channel Africa	17770af			
1500	1530	h	Seychelles, FEBA Radio	11600as			
1500	1530		UK, BBC World Service	5975as	6190af	6195as	9740as
			11940af	12095eu	15310as	15400af	15485eu
			17700as	17830af	17840am	21470af	21660af
1500	1530		USA, VOA Special English		6160as	9590as	9760as
			12040as	15550as			9845as
1500	1556		North Korea, Voice of Korea		4405va	6574na	9335na
			13760na				11710na
1500	1559		Canada, R Canada International		15455as	17720as	
1500	1559	as	Canada, R Canada International		9640am	15305am	17800am
1500	1600		Anguilla, Caribbean Beacon		11775am		
1500	1600	vl	Australia, ABC/Alice Springs		2310do		
1500	1600	vl	Australia, ABC/Katherine		2485do		
1500	1600	vl	Australia, ABC/Tennant Creek		2325do		
1500	1600	vl	Botswana, Radio		9600do		
1500	1600		Canada, CBC Northern Service		9625do		
1500	1600		Canada, CFRX Toronto ON		6070do		
1500	1600		Canada, CFVP Calgary AB		6030do		
1500	1600		Canada, CHNX Halifax, NS		6130do		
1500	1600		Canada, CKZN St John's NF		6160do		
1500	1600		Canada, CKZU Vancouver BC		6160do		
1500	1600		China China Radio International		7160as	7405na	9785as
			15125af				13685af
1500	1600		China, Voice of Hope		13820as		
1500	1600		Costa Rica, R for Peace Intl		15050va	21815usb	
1500	1600		Costa Rica, University Network		5030am	6150am	7375am
			11870am	13749na	17645as		9724sa
1500	1600	as/vl	Eqt. Guinea, Radio East Africa		15185af		
1500	1600	a/monthly	Finland, Scandv Weekend Radio		5990va	11720va	
1500	1600		Germany, Deutsche Welle		13640eu		
1500	1600	as	Germany, Overcomer Ministries		17490eu		
1500	1600		Germany, Overcomer Ministries		5110eu	13810af	
1500	1600		Germany, Voice of Hope		15715me		
1500	1600	vl	Ghana, Ghana BC Corp		4915do	6130do	

1500	1600		Guam, KTWR/ Trans World R		15330as		
1500	1600		Guyana, Voice of		5949do		
1500	1600		Japan, Radio		7200pa	9750as	11730as
1500	1600		Jordan, Radio		11690na	17680al	
1500	1600		Kenya, Kenya BC Corp		4885irr	4915irr	
1500	1600	vl	Lesotho, Radio		4800do		
1500	1600	vl	Liberia, ELWA		4760do		
1500	1600	vl	Liberia, R Liberia International			6100do	
1500	1600		Malaysia, Radio		7295do		
1500	1600		Malaysia, RTM Kota Kinabalu			5980do	
1500	1600		Malaysia, RTM Sarawak		7160do		
1500	1600		Myanmar, Radio		5985do		
1500	1600		Namibia, Namibian BC Corp			7165af	7215af
1500	1600		Netherlands, Radio		9515na	9890as	11835as
			15220na				11865na
1500	1600	occsnal	New Zealand, R New Zealand Int			6095pa	12075as
1500	1600		New Zealand, ZLXA		3935do		
1500	1600	vl	Nigeria, Radio/Enugu		6025do		
1500	1600	vl	Nigeria, Radio/Ibadan		6050do		
1500	1600	vl	Nigeria, Radio/Kaduna		4770do	6090do	7275do
1500	1600	vl	Nigeria, Radio/Lagos		4990do	7285do	9570do
1500	1600	vl	Russia, Voice of Russia WS		9730eu	11500as	11985me
1500	1600		Singapore, SBC Radio One			6150do	
1500	1600		Sri Lanka, Sri Lanka BC Corp			4940do	6005as
			15425as				6075as
1500	1600		Uganda, Radio		7196do		9770as
1500	1600	s	UK, Merlin Network One		6175eu		
1500	1600		USA, Armed Forces Radio		6350va	6458va	4278va
			13254va		13362va	16847va	4319va
1500	1600		USA, KAUJ Dallas TX		13815va		4993va
1500	1600		USA, KTNB Salt Lake City UT			15590na	5765va
1500	1600		USA, KWHR Naalehu HI		9930as	11565pa	12689va
1500	1600		USA, Voice of America		7125as	9645as	
1500	1600		USA, WBCQ Monticello ME			9700me	15205eu
1500	1600		USA, WEWN Birmingham AL				15255va
1500	1600		USA, WHRA Greenbush ME			17494na	
1500	1600		USA, WHRI Noblesville IN			11875na	
1500	1600		USA, WINB Red Lion PA			17650af	
1500	1600		USA, WJCR Upton KY			15105am	
1500	1600	mtwhfa	USA, WRMI Miami FL		15724na		
1500	1600	s	USA, WRMI Miami FL		9955am		
1500	1600		USA, WRNO New Orleans LA			7395am	
1500	1600		USA, WTJC Newport NC			15420al	
1500	1600		USA, WWCR Nashville TN				
1500	1600		USA, WWFV McCaysville GA			9475na	12160na
1500	1600		USA, WYFR Okeechobee FL			12172va	13845na
1500	1600		Zambia, Christian Voice			5280as	15685na
1500	1600	vl	Zambia, National BC Corp			6165do	11830na
1500	1600	vl	Zimbabwe, Zimbabwe BC Corp			5975do	17750na
1515	1600	m	Seychelles, FEBA Radio			6045do	
1530	1600		Australia, Radio			9475as	9580va
1530	1600		Austria, AWR Europe			7165eu	11650va
1530	1600		Austria, R Austria International			6155eu	11660as
1530	1600	vl	Botswana, Radio			4820do	13730eu
1530	1600		Georgia, Georgian Radio			6180me	17865na
1530	1600		Iran, Voice of Islamic Rep. of Iran			7245as	7255do
1530	1600	mtwhf	S Africa, World Beacon			6145af	9635as
1530	1600	as	Seychelles, FEBA Radio			11600as	11775na
1530	1600		UK, BBC World Service			5975as	
			11940af			6190af	6195as
			17830af			15400af	9740as
1550	1600		Vatican City, Vatican Radio			12065au	15485eu
						13765au	15565eu
						15235au	17700as

## 1600

1600	1610		Vatican City, Vatican Radio		12065au	13765au	15235au	
1600	1615		Pakistan, Radio	11570me	15100af	15725af	17720af	
1600	1625		Netherlands, Radio	9890as	11835as	12075as		
1600	1627		Czech Rep, Radio Prague Intl		5930eu	21745af		
1600	1630		Iran, Voice of Islamic Rep. of Iran		7245as	9635as	11775as	
1600	1630		Israel, Kol Israel	15615va	17545va	21670va		
1600	1630		Jordan, Radio	11690na	17680al			
1600	1630		Mexico, R Mexico International		9705am	11770am		
1600	1630		Netherland, Radio	9515na				
1600	1630		S Africa, Channel Africa	9525af				
1600	1630		UK, BBC World Service	3915as	5975as	6190af	6195as	7160as
			9410eu	9740as	11940af	12095eu	15310as	15400af
			15565eu	17700as	17830af	17840am	21470af	21660af
1600	1630	vl	Zimbabwe, Zimbabwe BC Corp		5975do	6045do		
1600	1640		UAE, Radio Dubai	13630eu	13675eu	15395eu	21605eu	
1600	1645		Germany, Deutsche Welle		6140eu	6170as	7225as	9735af
			11665af	17595as	21840af			
1600	1650	occsnal	New Zealand, R New Zealand Int		6095pa			
1600	1656		North Korea, Voice of Korea		3560va	6520va	9660va	9975va
1600	1700		Algeria, R Algiers International		11715va	15160va		
1600	1700		Anguilla, Caribbean Beacon		11775am			
1600	1700	vl	Australia, ABC/Alice Springs		2310do			
1600	1700	vl	Australia, ABC/Katherine		2485do			
1600	1700	vl	Australia, ABC/Tennant Creek		2325do			
1600	1700		Australia, Radio	5995va	9475as	9580va	11650va	11660as
1600	1700	vl	Botswana, Radio	3356do	4820do	7255do		
1600	1700		Canada, CBC Northern Service		9625do			
1600	1700		Canada, CFRX Toronto ON		6070do			
1600	1700		Canada, CFVP Calgary AB		6030do			
1600	1700		Canada, CHNX Halifax, NS		6130do			
1600	1700		Canada, CKZN St John's NF		6160do			
1600	1700		Canada, CKZU Vancouver BC		6160do			
1600	1700		China China Radio International		7190af	13650af		
1600	1700		Costa Rica, R for Peace Intl		15050va	21815sub		
1600	1700		Costa Rica, University Network		5030am	6150am	7375am	9724sa

# Shortwave Guide



1600	1700		11870am 13749na						
1600	1700	a/monthly	Ethiopia, Radio 7165af	9560af					
1600	1700		Finland, Scandv Weekend Radio	5990va	11720va				
1600	1700		France R France International	11615af	11995af	12015af	15605af		
1600	1700		17605af 17850af						
1600	1700	a	Germany, Good News World R	15105af					
1600	1700	as	Germany, Overcomer Ministries	17490eu					
1600	1700	vi	Ghana, Ghana BC Corp	4915do	6130do				
1600	1700	a	Greece, Voice of	15630eu	17705na				
1600	1700		Guam, KSDA/ Adventist World R	11850as					
1600	1700		Guyana, Voice of	5949do					
1600	1700		Kenya, Kenya BC Corp	4885irr					
1600	1700	vi	Lesotho, Radio	4800do					
1600	1700	vi	Liberia, ELWA	4760do					
1600	1700	vi	Liberia, R Liberia International		6100do				
1600	1700		Malaysia, Radio	7295do					
1600	1700		Namibia, Namibian BC Corp		7165af	7215af			
1600	1700		New Zealand, ZLXA	3935do					
1600	1700	vi	Nigeria, Radio/Enugu	6025do					
1600	1700	vi	Nigeria, Radio/Ibadan	6050do					
1600	1700	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do		
1600	1700	vi	Nigeria, Radio/Lagos	3326do	4990do				
1600	1700		Russia, Voice of Russia WS	7305as	9730eu	11985me	12055as		
1600	1700		15540me						
1600	1700		S Africa, World Beacon	6145af					
1600	1700		South Korea, R Korea Intl		5975om	6150eu	9515af	9870af	
1600	1700		Sri Lanka, Sri Lanka BC Corp	4940do					
1600	1700		Taiwan, Radio Taipei International	11550as					
1600	1700		Uganda, Radio	7196do					
1600	1700	a	UK, Merlin Network One	6175eu					
1600	1700		UK, World Beacon	15455eu					
1600	1700		USA, Armed Forces Radio		4278va	4319va	4993va	5765va	
1600	1700		6350va 6458va 6847va	10320va	10940va	12579va	12689va		
1600	1700		13254va 13362va 16847va						
1600	1700		USA, KAIJ Dallas TX	13815va					
1600	1700		USA, KTNB Salt Lake City UT		15590na				
1600	1700		USA, KWHR Naalehu HI	9930as					
1600	1700		USA, VOA Special English	13600af	15445af	17895af			
1600	1700		USA, Voice of America	6035af	6160as	7125as	9645as	9700me	
1600	1700		9760as 13605af 13710af	15205eu	15225af	15255va	15410af		
1600	1700		USA, WBCQ Monticello ME	17494na					
1600	1700		USA, WEWN Birmingham AL	11875na	13615na	15745eu			
1600	1700		USA, WHRA Greenbush ME	17650af					
1600	1700		USA, WHRI Noblesville IN	13760va	15105am				
1600	1700		USA, WINB Red Lion PA	13570am					
1600	1700		USA, WJCR Upton KY	7490am	13595as				
1600	1700		USA, WMLK Bethel PA	15265eu					
1600	1700	mtwhfa	USA, WRMI Miami FL	15724na					
1600	1700	s	USA, WRMI Miami FL	9955am					
1600	1700		USA, WRNO New Orleans LA	7395am	15420al				
1600	1700		USA, WSHB Cypress Crk SC	18910af					
1600	1700		USA, WTJC Newport NC	9370na					
1600	1700		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na		
1600	1700		USA, WWFV McCaysville GA	12172va					
1600	1700		USA, WYFR Okeechobee FL	11830na	17750na	18980eu	21455eu		
1600	1700		21525af						
1600	1700		Zambia, Christian Voice	4965do					
1600	1700	vi	Zambia, National BC Corp		6165do	6265do			
1615	1630		Vatican City, Vatican Radio	4005eu	5885eu	7250eu	9645eu		
1615	1700as		15595eu						
1625	1640		UK, BBC World Service	11860af	21490af				
1630	1657		Armenia, Trans World Radio	5855me					
1630	1700	vi	Vietnam, Voice of	9730eu	11630al	13740eu			
1630	1700		Cameroon, CRTV Radio Buea	6005do					
1630	1700		Egypt, Radio Cairo	15255af					
1630	1700	as	Slovakia, R Slovakia International	5920eu	6055eu	7345eu			
1630	1700		UK, BBC World Service	11860af					
1630	1700		UK, BBC World Service	3915as	5975as	6109af	6195as	7160as	
1630	1700		9410eu 9740as 11940af	12095eu	15310as	15400af	15420af		
1630	1700	f	15485eu 15565eu 17700as	17830af	17840am	21470af	21660af		
1630	1700	mtwh	UK, Merlin Network One	11535as					
1630	1700	as	UK, Merlin Network One	11590as					
1630	1700	vi	UK, Merlin Network One	11540as					
1645	1700		Zimbabwe, Zimbabwe BC Corp		4828do	6045do			
1650	1700	mtwhf	Germany, Deutsche Welle	6140eu					
1650	1700		New Zealand, R New Zealand Int	9825as					

## 1700

1700	1727		Czech Rep, Radio Prague Intl	5930eu	21745af				
1700	1727		Vietnam, Voice of	12070eu					
1700	1730		Azerbaijan, Voice of	6110eu	9155eu				
1700	1730		France R France International	15605af	17605af				
1700	1730		Germany, Overcomer Ministries	6110eu					
1700	1730		S Africa, Channel Africa	17870af					
1700	1746		UK, BBC World Service	3255af	3915as	5975as	6005af	6190af	
1700	1746		6195eu 7160as 9410eu	15400af	15420af	15485eu	15575me	17830af	21470af
1700	1755		Poland, Radio Polonia	6000eu	7285eu				
1700	1756		Romania, R Romania International	11740eu	15365eu	15380eu	17805eu		
1700	1800		Anguilla, Caribbean Beacon	11775am					
1700	1800	vi	Australia, ABC/Alice Springs	2310do					
1700	1800	vi	Australia, ABC/Katherine	2485do					
1700	1800	vi	Australia, ABC/Tennant Creek	2325do					
1700	1800		Australia, Radio	5995va	9475as	9580va	9655va	9815as	
1700	1800		11880va						
1700	1800	vi	Botswana, Radio	3356do	4820do	7255do			
1700	1800		Canada, CBC Northern Service	9625do					
1700	1800		Canada, CFRX Toronto ON	6070do					
1700	1800		Canada, CFVY Calgary AB	6030do					
1700	1800		Canada, CHNX Halifax, NS	6130do					
1700	1800		Canada, CKZN St John's NF	6160do					

1700	1800		Canada, CKZU Vancouver BC	6160do				
1700	1800		China China Radio International	7150af	9570af	9670af	9695af	
			11910af 15365af					
1700	1800		Costa Rica, R for Peace Intl	15050va	21815usb			
1700	1800		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
			11870am 13749na 17645as					
1700	1800		Egypt, Radio Cairo	15255af				
1700	1800	mtwhf	Eqt Guinea, Radio Africa	15185af				
1700	1800	a/monthly	Finland, Scandv Weekend Radio	6170va	11720va			
1700	1800		Germany, Deutsche Welle	6140eu				
1700	1800	a	Germany, Good News World R	11795me				
1700	1800	a	Germany, Overcomer Ministries	17490eu				
1700	1800		Germany, Voice of Hope	9495eu				
1700	1800		Germany, Unt Methodist Church	13820af	15485af			
1700	1800	vi	Ghana, Ghana BC Corp	3366do	4915do			
1700	1800		Guyana, Voice of	5949do				
1700	1800	vi	Italy, Italian Radio Relay Service	3985va				
1700	1800		Japan, Radio	9505na	11970eu	15355af		
1700	1800		Kenya, Kenya BC Corp	4885irr	4915irr			
1700	1800	vi	Lesotho, Radio	4800do				
1700	1800	vi	Liberia, ELWA	4760do				
1700	1800	vi	Liberia, R Liberia International	6100do				
1700	1800		Namibia, Namibian BC Corp	3270af	3289af			
1700	1800		Netherlands, Radio	17840na				
1700	1800	mtwhf	New Zealand, R New Zealand Int		9825as			
1700	1800		New Zealand, ZLXA	3935do				
1700	1800	vi	Nigeria, Radio/Enugu	6025do				
1700	1800	vi	Nigeria, Radio/Ibadan	6050do				
1700	1800	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1700	1800	vi	Nigeria, Radio/Lagos	3326do	4990do			
1700	1800	as	Russia, Voice of Russia WS	7420eu	9480eu	9820eu	11675eu	
1700	1800		Russia, Voice of Russia WS	7310eu	9745af	9775eu	9890eu	
			11510af 11985af					
1700	1800		S Africa, World Beacon	6145af				
1700	1800		Sierra Leone, Sierra Leone BS	3316do				
1700	1800		Sri Lanka, Sri Lanka BC Corp	3316irr				
1700	1800		Uganda, Radio	7196do				
1700	1800	as	UK, Merlin Network One	11540as				
1700	1800		UK, World Beacon	15455eu				
1700	1800		USA, Armed Forces Radio		4278va	4319va	4993va	5765va
			6350va 6458va 6847va	10320va	10940va	12579va	12689va	
			13254va 13362va 16847va					
1700	1800		USA, KAIJ Dallas TX	13815va				
1700	1800		USA, KTNB Salt Lake City UT		15590na			
1700	1800		USA, KWHR Naalehu HI	9930as				
1700	1800		USA, Voice of America	6160as	7125as	7170as	9645as	9700me
			9760af 15255va 15410af	6045as	7215as	9550as	9770as	
1700	1800	mtwhf	USA, Voice of America	5990as				
			9785as					
1700	1800		USA, WBCQ Monticello ME	17494na				
1700	1800		USA, WEWN Birmingham AL	11875na	13615na	15745eu		
1700	1800		USA, WHRA Greenbush ME	17650af				
1700	1800		USA, WHRI Noblesville IN	9495am	13760va			
1700	1800		USA, WINB Red Lion PA	13570am				
1700	1800		USA, WJCR Upton KY	7490am	13595as			
1700	1800	mtwhf	USA, WMLK Bethel PA	15265eu				
1700	1800		USA, WRMI Miami FL	15724na				
1700	1800		USA, WRNO New Orleans LA	7395am	15420al			
1700	1800		USA, WSHB Cypress Crk SC	18910af				
1700	1800		USA, WTJC Newport NC	9370na				
1700	1800		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
1700	1800		USA, WWFV McCaysville GA	12172va				
1700	1800		USA, WYFR Okeechobee FL	13855af	18980eu	21455eu		
1700	1800		Zambia, Christian Voice	4965do				
1700	1800	vi	Zambia, National BC Corp	6165do	6265do			
1700	1800	vi	Zimbabwe, Zimbabwe BC Corp	4828do	6045do			
1725	1740		Germany, Trans World Radio	5855eu				
1725	1745	mtwhf	UK, United Nations Radio	6125af	15265me	17580af		
1730	1745	vi	Libya, Voice of Africa	11815af	15435af	17725af		
1730	1745	as	Swaziland, Trans World Radio	9500af				
1730	1745	mtwhf	Swaziland, Trans World Radio	3200af				
1730	1800	mtwhf	Belgium, RVI Flanders R Intl	5910eu	9925eu	13770eu		
1730	1800		Georgia, Georgian Radio	6230eu				
1730	1800	as	Georgia, Georgian Radio	6080as				
1730	1800		Guam, KSDA/ Adventist World R	11965as				
1730	1800		Netherlands, Radio	6020af	7120af	11655af		
1730	1800		Philippines, Radyo Pilipinas	11720pa	15190pa	17720pa		
1730	1800		S Africa, Adv World Radio Africa	12130af				
1730	1800	mtwhf	Sweden, Radio	6065va				
1730	1800	s	Sweden, Radio	13580eu				
1730	1800		Switzerland, Swiss R International	15220af	17735af	21720af		
1730	1800		Vatican City, Vatican Radio	13765af	15570af	17515af		
1735	1745	vi/th	Paraguay, Radio Nacional	9739sa				
1745	1800		Bangladesh, Bangla Betar	7185eu	9550eu	15520eu		
1745	1800		India, All India Radio	7410eu	9950as	11935as	13750af	13790af
			15155af 17670af					
1745	1800	smtwhf	Swaziland, Trans World Radio	3200af				
1746	1800		UK, BBC World Service	3255af	3915as	5975as	6190af	6195eu
			7160as 9410eu 9510as	9740as	12095eu	15400af	15420af	
			15485eu 15575me 17830af	21470af				

# Shortwave Guide



1800	1830	mtwh	UK, Merlin Network One	11590as				
1800	1830		UK, Merlin Network One	11540as				
1800	1830	f	UK, Merlin Network One	11535as				
1800	1830		UK, RTE Radio	15315me				
1800	1850	mtwhf	New Zealand, R New Zealand Int	9825as				
1800	1858		Yemen, Rep of Yemen Radio	9780me				
1800	1859		Canada, R Canada International	13690af	15470af	17820af	21570af	
1800	1900		Anguilla, Caribbean Beacon	11775am				
1800	1900	mtwhf	Argentina, RAE	15345eu				
1800	1900	vl	Australia, ABC/Alice Springs	2310do				
1800	1900	vl	Australia, ABC/Katherine	2485do				
1800	1900	vl	Australia, ABC/Tennant Creek	2325do				
1800	1900		Australia, Radio	6080pa	9475as	9580va	9815pa	
1800	1900			11880va				
1800	1900		Bangladesh, Bangla Betar	7185eu	9550eu	15520eu		
1800	1900	vl	Botswana, Radio	3356do				
1800	1900		Canada, CBC Northern Service	9625do				
1800	1900		Canada, CFRX Toronto ON	6070do				
1800	1900		Canada, CFVP Calgary AB	6030do				
1800	1900		Canada, CHNX Halifax, NS	6130do				
1800	1900		Canada, CKZN St John's NF	6160do				
1800	1900		Canada, CKZU Vancouver BC	6160do				
1800	1900		Costa Rica, R for Peace Intl	15050va	21815usb			
1800	1900		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
1800	1900			11870am 13749na	17645as			
1800	1900	mtwhf	Eat Guinea, Radio Africa	15185af				
1800	1900	a/monthly	Finland, Scandv Weekend Radio	6170va	11720va			
1800	1900		Germany, Deutsche Welle	6140eu				
1800	1900		Germany, Unt Methodist Church	13820af	15485af			
1800	1900		Germany, Voice of Hope	9495eu				
1800	1900	vl	Ghana, Ghana BC Corp	3366do	4915do			
1800	1900	s	Greece, Voice of	9420eu	15630na			
1800	1900		Guyana, Voice of	5949do				
1800	1900		India, All India Radio	7410as	9950as	11935as	13750af	13790af
1800	1900			15155af 17670af				
1800	1900	vl	Italy, Italian Radio Relay Service	3985va				
1800	1900		Kenya, Kenya BC Corp	4885irr	4915irr			
1800	1900		Kuwait, Radio	11990va				
1800	1900	vl	Lesotho, Radio	4800do				
1800	1900	vl	Liberia, ELWA	4760do				
1800	1900	vl	Liberia, R Liberia International	5100do				
1800	1900		Namibia, Namibian BC Corp	3270af	3289af			
1800	1900		New Zealand, ZLXA	3935do				
1800	1900	vl	Nigeria, Radio/Enugu	6025do				
1800	1900	vl	Nigeria, Radio/Ibadan	6050do				
1800	1900	vl	Nigeria, Radio/Kaduna	4770do				
1800	1900	vl	Nigeria, Radio/Lagos	3326do	6090do	7275do	9570do	
1800	1900		Philippines, Radyo Pilipinas	11720pa	15190pa	17720pa		
1800	1900		Russia, Voice of Russia WS	7300eu	7310eu	7420eu	9480eu	
1800	1900			9745af 9775eu	9820eu	9890eu	11510af	11695me 11980af
1800	1900	m	S Africa, Amateur Radio League	3215af				
1800	1900	as	S Africa, Radio Lufonia	3345af				
1800	1900		S Africa, World Beacon	3230af	9675af	17665af		
1800	1900		Sierra Leone, Sierra Leone BS	3316do				
1800	1900		Sri Lanka, Sri Lanka BC Corp	3316irr				
1800	1900		Swaziland, Trans World Radio	3200af	9500af			
1800	1900		Taiwan, Radio Taipei International	3955eu				
1800	1900		Uganda, Radio	7196do				
1800	1900		UK, World Beacon	15585af				
1800	1900		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
1800	1900			6350va 6458va 6847va	10320va	10940va	12579va	12689va
1800	1900			13254va 13362va				
1800	1900		USA, KAIJ Dallas TX	13815va				
1800	1900		USA, KJES Vado NM	15385sa				
1800	1900		USA, KTVN Salt Lake City UT	15590na				
1800	1900		USA, KWHR Naalehu HI	17510as				
1800	1900		USA, Voice of America	6035af	7415af	9760af	9770me	11975af
1800	1900			15410af 15580af	17895af			
1800	1900	mtwhfa	USA, WBCQ Monticello ME	17494na				
1800	1900		USA, WEWN Birmingham AL	11875na	13615na	15745eu		
1800	1900		USA, WHRA Greenbush ME	17650af				
1800	1900		USA, WHRI Noblesville IN	9495am	13760va			
1800	1900		USA, WINB Red Lion PA	13570am				
1800	1900		USA, WJCR Upton KY	7490am	13595as			
1800	1900		USA, WMLK Bethel PA	15265eu				
1800	1900	mtwhf	USA, WRMI Miami FL	15724na				
1800	1900		USA, WRNO New Orleans LA	7395am	15420al			
1800	1900		USA, WSHB Cypress Crk SC	15665va	18910af			
1800	1900		USA, WTJC Newport NC	9370na				
1800	1900		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
1800	1900		USA, WWFV McCaysville GA	12172va				
1800	1900		USA, WYFR Okeechobee FL	18980eu				
1800	1900	vl	Zambia, Christian Voice	4965do				
1800	1900	vl	Zambia, National BC Corp	6165do	6265do			
1800	1900	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do			
1815	1845	s	S Africa, Radio Lufonia	7155af				
1830	1855		Greece, Voice of	11645eu				
1830	1900		Ascension Island, RTE Radio	21630af				
1830	1900		Austria, R Austria International	5945eu	6155eu			
1830	1900	vl	Cameroon, CRTV Radio Buea	6005do				
1830	1900		Canada, RTE Radio	13640na				
1830	1900		Georgia, Georgian Radio	11760eu				
1830	1900		Netherlands, Radio	6020af	7120af	9895af	11655af	13700af
1830	1900			17605af 21590af				
1830	1900		Slovakia, R Slovakia International	5920eu	6055eu	7345eu		
1830	1900		Turkey, Voice of	9730as				
1830	1900		UK, BBC World Service	3255af	6005af	6190af	6195eu	9410eu
1830	1900			9630af 12095as	15400af	15575me	17830af	21470af
1830	1900		USA, Voice of America	11690af				
1830	1900	as	Yugoslavia, Radio	6100eu				
1845	1900		Albania, R Tirana International	7210eu	9510eu			
1845	1900		Congo, RTV Congolaise	4765af				
1851	1900		New Zealand, R New Zealand Int	15160pa				

## 1900

1900	1915		Congo, RTV Congolaise	4765do	5985af			
1900	1927		Vietnam, Voice of	9730eu	11630al	13740eu		
1900	1930		Hungary, Radio Budapest		7130eu			
1900	1930		Israel, Kol Israel	9435va	11605va	15615va	15640af	17545va
1900	1930		Philippines, Radyo Pilipinas		11720pa	15190pa	17720pa	
1900	1930		Switzerland, Swiss R International		6110eu			
1900	1930		Turkey, Voice of	9730as	9785eu			
1900	1945		Germany, Deutsche Welle		11805af	11965af	13720af	15390af
			17810af					
1900	1945		India, All India Radio	7410as	9950as	11935as	13750af	13790af
			15155af 17670af					
1900	1956		North Korea, Voice of Korea		4405va	6574na	6595na	6615na
			9335na 11710na	13760na				
1900	2000		Anguilla, Caribbean Beacon		11775am			
1900	2000	vl	Australia, ABC/Katherine		2485do			
1900	2000	vl	Australia, ABC/Tennant Creek		2325do			
1900	2000		Australia, Radio	6080pa	7240va	9500as	9580va	9815pa
			11880va					
1900	2000	vl	Botswana, Radio	3356do	4820do			
1900	2000		Bulgaria, Radio	11900eu				
1900	2000		Canada, CFRX Toronto ON		6070do			
1900	2000		Canada, CFVP Calgary AB		6030do			
1900	2000		Canada, CHNX Halifax, NS		6130do			
1900	2000		Canada, CKZN St John's NF		6160do			
1900	2000		Canada, CKZU Vancouver BC		6160do			
1900	2000		Canada, CBC Northern Service		9625do			
1900	2000		China China Radio International		6165af	9440af	9585af	
1900	2000		Costa Rica, R for Peace Intl		15050va	21815sub		
1900	2000		Costa Rica, University Network		5030am	6150am	7375am	9724sa
			11870am 13749na	17645as				
1900	2000		Ecuador, HCJB	17660eu				
1900	2000	mtwhf	Eat Guinea, Radio Africa		15185af			
1900	2000	a/monthly	Finland, Scandv Weekend Radio		6170va	11690va		
1900	2000		Germany, Voice of Hope	7290eu	15750as			
1900	2000	vl	Ghana, Ghana BC Corp		3366do	4915do		
1900	2000	vl	Italy, Italian Radio Relay Service		3985va			
1900	2000		Kenya, Kenya BC Corp	4885irr	4915irr			
1900	2000		Kuwait, Radio	11990va				
1900	2000	vl	Lesotho, Radio	4800do				
1900	2000	vl	Liberia, ELWA	4760do				
1900	2000	vl	Liberia, R Liberia International		5100do			
1900	2000	asmtwh	Malta, Voice of Mediterranean		12060eu			
1900	2000		Namibia, Namibian BC Corp		3270af	3289af		
1900	2000		Netherlands, Radio	6020af	7120af	9895af	11655af	13700af
			17605af 21590af					
1900	2000		New Zealand, R New Zealand Int		15160pa			
1900	2000		New Zealand, ZLXA	3935do				
1900	2000	vl	Nigeria, Radio/Enugu	6025do				
1900	2000	vl	Nigeria, Radio/Ibadan	6050do				
1900	2000	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1900	2000	vl	Nigeria, Radio/Lagos	3326do	4990do			
1900	2000		Nigeria, Voice of	7255af	11770af	15120na		
1900	2000		Russia, Voice of Russia WS		7310eu	7400eu	7420eu	7420eu
			7440eu 9775eu	9820eu	9890eu			
1900	2000		Russia, World Beacon	7360eu				
1900	2000		S Africa, World Beacon	3230af	9675af	11640af		
1900	2000		Sierra Leone, Sierra Leone BS		3316do			
1900	2000	vl	Solomon Islands, SIBC	5020do				
1900	2000		South Korea, R Korea Intl		5975am	7275eu		
1900	2000		Sri Lanka, Sri Lanka BC Corp		3316irr			
1900	2000	a	Sri Lanka, Sri Lanka BC Corp		6010eu			
1900	2000		Swaziland, Trans World Radio		3200af			
1900	2000		Thailand, Radio	7160eu				
1900	2000		Uganda, Radio	7196do				
1900	2000		UK, BBC World Service	3255af	6005af	6190af	6195eu	9410eu
			9630af 12095eu	12095eu	15400af	15575me	17830af	
1900	2000		UK, World Beacon	9675eu	15585eu			
1900	2000		USA, Armed Forces Radio		4278va	4319va	4993va	5765va
			6350va 6458va	6847va	10320va	10940va	12579va	12689va
			13254va 13362va	16847va				
1900	2000		USA, KATJ Dallas TX	13815va				
1900	2000		USA, KTVB Salt Lake City UT		15590na			
1900	2000		USA, KWHR Naalehu HI	17510as				
1900	2000		USA, VOA Special English		7260eu	9680me	13690me	
1900	2000		USA, Voice of America	4950af	6035af	6160me	7375af	7415af
			9525pa 9760af	9770af	11805pa	11975af	15180pa	15410af
			15445af 15580af					
1900	2000	mtwhf	USA, Voice of America	9550eu	9840as	11780me	11970as	12015as
			13725me 15235as					
1900	2000	mtwhfa	USA, WBCQ Monticello ME		17494na			
1900	2000		USA, WEWN Birmingham AL		11875na	13615na	15745eu	
1900	2000		USA, WHRA Greenbush ME		17650af			
1900	2000		USA, WHRI Noblesville IN		9495am	13760va		
1900	2000		USA, WINB Red Lion PA	13570am				
1900	2000		USA, WJCR Upton KY	7490am	13595as			
1900	2000		USA, WMLK Bethel PA	15265eu				
1900	2000	mtwhf	USA, WRMI Miami FL	15724na				
1900	2000		USA, WRNO New Orleans LA		7395am	15420al		
1900	2000		USA, WSHB Cypress Crk SC		15665va	18910af		
1900	2000		USA, WTJC Newport NC	9370na				
1900	2000		USA, WWCN Nashville TN		9475na	12160na	13845na	15685na
1900	2000		USA, WWVF McCaysville GA		12127va			
1900	2000		USA, WYFR Okeechobee FL		15775af	18980eu		
1900	2000		Zambia, Christian Voice	4965do				
1900	2000	vl	Zambia, National BC Corp		6165do	6265do		
1900	2000	vl	Zimbabwe, Zimbabwe BC Corp		4828do	6045do		
1930	2000	t h	Belarus, R Belarus International		7105eu	7210eu		
1930	2000		Belgium, RVI Flanders R Intl		9925eu			
1930	2000		Iran, Voice of Islamic Rep. of Iran		9022eu	11670eu	13730eu	
1930	2000	vl	Papua New Guinea, NBC		4890do			
1930	2000		Poland, Radio Polonia	6035eu	7185eu	7265eu	9525eu	



# Shortwave Guide



1930	2000	Sweden, Radio	6065eu				
1930	2000	Switzerland, Swiss R International	13770af	15220af	17580af	17735af	
1935	1955	Italy, RAI International	9750eu				
1940	2000	Armenia, Voice of	9960eu				
1950	1950	Vatican City, Vatican Radio	4005eu	5885eu	7250eu	9645eu	

## 2000

2000	2010	Vatican City, Vatican Radio	4005eu	5885eu	7250eu	9645eu	
		9660af 11625af 13765af					
2000	2015	Swaziland, Trans World Radio	3200af				
2000	2025	Netherlands, Radio	7120af	9895af	11655af	13700af	
		17605af 21590af					
2000	2025	Poland, Radio Polonia	6035eu	7185eu	7265eu	9525eu	
2000	2027	Czech Rep, Radio Prague Intl	5930eu		11600au		
2000	2030	Ecuador, HCJB	17660eu				
2000	2030	Iran, Voice of Islamic Rep. of Iran	9022eu	11670eu	13730eu		
2000	2030	Mongolia, Voice of	12015eu	12085eu			
2000	2030	Switzerland, Swiss R International	13770af	15220af	17580af	13660af	
		13790af					
2000	2030	USA, Voice of America	4950af	6035af	6095af	7375af	7415af
		9760as 9770af 11855af	11975af	15410af	15445af	15580af	
		17745af 17895af					
2000	2045	Germany, Deutsche Welle	7130eu				
2000	2045	Iraq, Radio Iraq International	7157irr	9684irr	11785irr		
2000	2059	Canada, R Canada International	5995eu	11690eu	15325eu	17870eu	
		21570eu					
2000	2100	Algeria, R Algiers International	11715eu	11750eu	15160va		
2000	2100	Anguilla, Caribbean Beacon	11775am				
2000	2100	Australia, ABC/Alice Springs	2310do				
2000	2100	Australia, ABC/Katherine	2485do				
2000	2100	Australia, ABC/Tennant Creek	2325do				
2000	2100	Australia, Radio	9500as	9580va	9815pa	11880va	12080va
2000	2100	Botswana, Radio	3356do				
2000	2100	Canada, CBC Northern Service	9625do				
2000	2100	Canada, CFRX Toronto ON	6070do				
2000	2100	Canada, CFVP Calgary AB	6030do				
2000	2100	Canada, CHNX Halifax, NS	6130do				
2000	2100	Canada, CKZN St John's NF	6160do				
2000	2100	Canada, CKZU Vancouver BC	6160do				
2000	2100	China, China Radio International	13640af	9440af	9840eu	11735af	
2000	2100	Costa Rica, R for Peace Intl	15050va	21815usb			
2000	2100	Costa Rica, University Network	5030am	6150am	7375am	9724sa	
		11870am 13749na 17645as					
2000	2100	Eat Guinea, Radio Africa	15185af				
2000	2100	Finland, Scandv Weekend Radio	6170va	11690va			
2000	2100	Germany, Voice of Hope 7290eu	15750as				
2000	2100	Ghana, Ghana BC Corp	3366do	4915do			
2000	2100	Indonesia, Voice of	9525eu	11784eu	15149eu		
2000	2100	Italy, Italian Radio Relay Service	3985va				
2000	2100	Kenya, Kenya BC Corp	4885irr	4915irr			
2000	2100	Kuwait, Radio	11990va				
2000	2100	Lesotho, Radio	4800do				
2000	2100	Liberia, ELWA	4760do				
2000	2100	Liberia, R Liberia International	5100do				
2000	2100	Namibia, Namibian BC Corp	3270af	3289af			
2000	2100	New Zealand, R New Zealand Int	15160pa				
2000	2100	New Zealand, ZLXA	3935do	7290do			
2000	2100	Nigeria, Radio/Enugu	6025do				
2000	2100	Nigeria, Radio/Ibadan	6050do				
2000	2100	Nigeria, Radio/Kaduna	4770do				
2000	2100	Nigeria, Radio/Lagos	3326do	6090do	7275do	9570do	
2000	2100	Nigeria, Voice of	7255af	4990do	11770af	15120na	
2000	2100	Papua New Guinea, NBC	4890do				
2000	2100	Russia, Voice of Russia WS	7500eu	7420eu	9775eu	9820eu	
		9890eu 11980eu					
2000	2100	Russia, World Beacon	7360eu				
2000	2100	S Africa, World Beacon	3230af	9675af	11640af	15465eu	
2000	2100	Solomon Islands, SIBC	5020do				
2000	2100	Spain, R Exterior Espana 9595af	15290eu				
2000	2100	Sri Lanka, Sri Lanka BC Corp	4940irr				
2000	2100	Syria, Radio Damascus	12085eu	13610eu			
2000	2100	Uganda, Radio	7196do				
2000	2100	UK, BBC World Service	3255af	6005af	6190af	6195eu	9410eu
		9630af 11835af 12095eu	15400af	17830af			
2000	2100	UK, World Beacon	7420af	9675af			
2000	2100	USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
		6350va 6458va 6847va	10320va	10940va	12579va	12689va	
		13254va 13362va 16847va					
2000	2100	USA, KAIJ Dallas TX	13815va				
2000	2100	USA, KJES Vado NM	15385na				
2000	2100	USA, KTBN Salt Lake City UT	15590na				
2000	2100	USA, KWHR Naalehu HI	17510as				
2000	2100	USA, WBCQ Monticello ME	7415na				
2000	2100	USA, WBCQ Monticello ME	17494na				
2000	2100	USA, WEWN Birmingham AL	11875na	13615na	15745eu		
2000	2100	USA, WHRA Greenbush ME	17650af				
2000	2100	USA, WHRI Noblesville IN	5745va	9495am			
2000	2100	USA, WINB Red Lion PA	13570am				
2000	2100	USA, WJCR Upton KY	7490am	13595as			
2000	2100	USA, WMLK Bethel PA	15265eu				
2000	2100	USA, WRMI Miami FL	15724na				
2000	2100	USA, WRNO New Orleans LA	7395am	15420al			
2000	2100	USA, WTJC Newport NC	9370na				
2000	2100	USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
2000	2100	USA, WWFV McCaysville GA	12172va				
2000	2100	USA, WYFR Okeechobee FL	17845af				
2000	2100	Vanuatu, Radio	3945do	4960do	7260do		
2000	2100	Zambia, Christian Voice 4965do					
2000	2100	Zambia, National BC Corp	6165do	6265do			
2000	2100	Zimbabwe, Zimbabwe BC Corp	4828do	6045do			
2000	2100	USA, WSHB Cypress Crk SC	15665va	18910af			

2010	2030	Vatican City, Vatican Radio	9660af	11625af	13765af		
2025	2045	Italy, RAI International	7125af	9635af	11800af		
2030	2045	Libya, Voice of Africa	11815af	15435af	17725af		
2030	2045	Thailand, Radio	9680eu				
2030	2057	Vietnam, Voice of	9730eu	11630al	13740eu		
2030	2100	Australia, Christian Voice	9865pa	11840as			
2030	2100	Belarus, R Belarus International	7105eu	7210eu			
2030	2100	Cuba, Radio Havana	13660eu	13750eu			
2030	2100	Ecuador, HCJB	17660eu	21455usb			
2030	2100	Egypt, Radio Cairo	15375af				
2030	2100	S Africa, Adv World Radio Africa	9745af				
2030	2100	Turkey, Voice of	7170as				
2030	2100	UK, Wales Radio Intl/Merlin	7325eu				
2030	2100	USA, Voice of America	6035af	6095me	7375af	7415af	9760af
2030	2100	9770af 11975af 15410af	15445af	15580af	17745af	17895af	
2030	2100	USA, Voice of America	4950af	9540eu	9545eu	9910au	9950eu
2030	2100	Uzbekistan, Radio Tashkent	7150eu	7410eu	9650eu		
2045	2100	India, All India Radio	11620au 11715au				

## 2100

2100	2110	Kenya, Kenya BC Corp	4885irr	4915irr			
2100	2115	Egypt, Radio Cairo	15375af				
2100	2130	Australia, ABC/Alice Springs	2310do				
2100	2130	Australia, ABC/Katherine	2485do				
2100	2130	Australia, ABC/Tennant Creek	2325do				
2100	2130	Australia, Christian Voice	9865pa	11840as			
2100	2130	Australia, Radio	7240va	9500as	9580va	9660pa	11880va
		12080va 17715va 21740va					
2100	2130	Austria, AWR Europe	15165af				
2100	2130	China China Radio International	5965eu	9840eu	11735af	13640af	
2100	2130	Cuba, Radio Havana	13660eu	13750eu			
2100	2130	South Korea, R Korea Intl	3975eu	15575eu			
2100	2130	Turkey, Voice of	7170as				
2100	2130	UK, BBC World Service	3255af	3915as	5965as	6005af	6190af
		6195va 9410eu 11835af	11945as	12095sa	15400af		
2100	2130	UK, BBC World Service	5975as	3915as			
2100	2130	Yugoslavia, Radio	6100eu				
2100	2145	Germany, Deutsche Welle	9670pa	9765pa	9875af	11865af	
		11915pa 15135af					
2100	2145	USA, WYFR Okeechobee FL	13855af	15120af	17845af	18980eu	
2100	2156	Romania, R Romania International	9725eu	11740eu	11940eu	15365eu	
2100	2200	Angola, R Nacional de Angola	3374va	4950va	7245va		
2100	2200	Anguilla, Caribbean Beacon	11775am				
2100	2200	Botswana, Radio	3356do	4820do			
2100	2200	Bulgaria, Radio	11900eu				
2100	2200	Canada, CBC Northern Service	9625do				
2100	2200	Canada, CFRX Toronto ON	6070do				
2100	2200	Canada, CFVP Calgary AB	6030do				
2100	2200	Canada, CHNX Halifax, NS	6130do				
2100	2200	Canada, CKZN St John's NF	6160do				
2100	2200	Canada, CKZU Vancouver BC	6160do				
2100	2200	Costa Rica, R for Peace Intl	15050va	21815usb			
2100	2200	Costa Rica, University Network	5030am	6150am	7375am	9724sa	
		11870am 13749na 17645as					
2100	2200	Ecuador, HCJB	17660eu				
2100	2200	Eat Guinea, Radio Africa	15185af				
2100	2200	Finland, Scandv Weekend Radio	5990va	11720va			
2100	2200	Ghana, Ghana BC Corp	3366do	4915do			
2100	2200	India, All India Radio	7150au	7410eu	9650eu	9910au	9950eu
		11620au 11715au					
2100	2200	Italy, Italian Radio Relay Service	3985va				
2100	2200	Japan, Radio	6035pa	6055eu	6180eu	11830eu	11855af
		17825na 17860pa 21670pa					
2100	2200	Lesotho, Radio	4800do				
2100	2200	Liberia, ELWA	4760do				
2100	2200	Liberia, R Liberia International	5100do				
2100	2200	Namibia, Namibian BC Corp	3270af	3289af			
2100	2200	New Zealand, R New Zealand Int	15160pa				
2100	2200	New Zealand, ZLXA	3935do	7290do			
2100	2200	Nigeria, Radio/Enugu	6025do				
2100	2200	Nigeria, Radio/Ibadan	6050do				
2100	2200	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
2100	2200	Nigeria, Radio/Lagos	3326do	4990do			
2100	2200	Nigeria, Voice of	7255af	11770af	15120na		
2100	2200	Papua New Guinea, NBC	4890do				
2100	2200	Russia, World Beacon	7360eu				
2100	2200	S Africa, World Beacon	3230af	9675af	11640af		
2100	2200	Solomon Islands, SIBC	5020do				
2100	2200	Spain, R Exterior Espana 9595af	15290eu				
2100	2200	Sri Lanka, Sri Lanka BC Corp	4940irr				
2100	2200	Syria, Radio Damascus	12085eu	13610eu			
2100	2200	UK, World Beacon	9675af				
2100	2200	Ukraine, R Ukraine International	11950eu	5905eu	6020eu	7410eu	1

# Shortwave Guide



2100	2200	USA, WRNO New Orleans LA	7395am	15420al		
2100	2200	USA, WSHB Cypress Crk SC	15665va	18910af		
2100	2200	USA, WTJC Newport NC 9370na				
2100	2200	USA, WWCR Nashville TN	9475na	12160na	13845na	15685na
2100	2200	USA, WWFV McCaysville GA	12172va			
2100	2200	USA< WBCQ Monticello ME	17494na			
2100	2200	Vanuatu, Radio	3945do	4960do	7260do	
2100	2200	Zambia, Christian Voice 4965do				
2100	2200	Zambia, National BC Corp	6165do	6265do		
2100	2200	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
2115	2130	UK, BBC Caribbean Report	5975ca	11675ca	15390ca	
2115	2200	Egypt, Radio Cairo	9990eu	15375af		
2120	2200	Greece, Voice of	9425au	15650au		
2130	2145	UK, BBC Calling Falklands	11680sa			
2130	2157	Czech Rep, Radio Prague Intl	11600au	15545af		
2130	2200	Albania, R Tirana International	7130eu	9540eu		
2130	2200	Australia, ABC/Alice Springs	4835do			
2130	2200	Australia, ABC/Katherine	5025do			
2130	2200	Australia, ABC/Tennant Creek	4910do			
2130	2200	Australia, Christian Voice	9725as	11840as		
2130	2200	Australia, Radio	7240va	11880va	12080pa	17715va
		21740va				
2130	2200	Austria, R Austria International	5945eu	6155eu		
2130	2200	Guam, KSDA Adventist World R	11980as	15240as		
2130	2200	Hungary, Radio Budapest	3975eu			
2130	2200	Iran, Voice of Islamic Rep. of Iran	9570as	13745as		
2130	2200	South Korea, R Korea Intl	15575eu			
2130	2200	Sweden, Radio	6065eu	15255as		
2130	2200	UK, BBC World Service	3255af	3915as	5965as	5975am
		6190af	6195va	9410eu	12095sa	6005af
2130	2200	Uzbekistan, Radio Tashkent	7105eu	9540eu		
2145	2200	USA, WYFR Okeechobee FL	13855af	15120af	17845af	

## 2200

2200	2210	vi	Zambia, National BC Corp	6165do	6265do		
2200	2215		New Zealand, R New Zealand Int	15160pa			
2200	2220	s	Greece, Voice of	15650au			
2200	2230		Canada, R Canada International	9755am	13670am	17695am	
2200	2230	mtwhf	Canada, R Canada International	15305am	17880am		
2200	2230		Canada, R Canada International	9755am	13670am	17695am	
2200	2230		India, All India Radio	7150au	7410eu	9650eu	9910au
			11620au	11715au			9950eu
2200	2230		Iran, Voice of Islamic Rep. of Iran	9570as	13745as		
2200	2230		Mexico, R Mexico International	9705am	11770am		
2200	2230	vi	Papua New Guinea, NBC	4890do			
2200	2230	mtwhf	USA, Voice of America	5855af	6035af	7375af	7415af
2200	2230	mtwhf	Yugoslavia, Radio	7230au			
2200	2245		Egypt, Radio Cairo	9990eu			
2200	2245		USA, WYFR Okeechobee FL	11740na	15120af	17845af	
2200	2300		Anguilla, Caribbean Beacon	6090am			
2200	2300	vi	Australia, ABC/Alice Springs	4835do			
2200	2300	vi	Australia, ABC/Katherine	5025do			
2200	2300	vi	Australia, ABC/Tennant Creek	4910do			
2200	2300		Australia, Christian Voice	17850as			
2200	2300		Australia, Radio	11880as	15240as	17715va	17795va
2200	2300		Canada, CBC Northern Service	9625do			
2200	2300		Canada, CFRX Toronto ON	6070do			
2200	2300		Canada, CFVP Calgary AB	6030do			
2200	2300		Canada, CHNX Halifax, NS	6130do			
2200	2300		Canada, CKZN St John's NF	6160do			
2200	2300		Canada, CKZU Vancouver BC	6160do			
2200	2300		China China Radio International	7170eu			
2200	2300		Costa Rica, R for Peace Intl	15050va	21815usb		
2200	2300		Costa Rica, University Network	5030am	6150am	7375am	9724sa
			11870am	13749na	17645as		
2200	2300	mtwhf	Eat Guinea, Radio Africa	15185af			
2200	2300	f/monthly	Finland, Scandv Weekend Radio	5990va	11720va		
2200	2300	vi	Ghana, Ghana BC Corp	3366do	4915do		
2200	2300	fas/vl	Italy, Italian Radio Relay Service	3985va			
2200	2300	vi	Liberia, R Liberia International	5100do			
2200	2300		Malaysia, Radio	7295do			
2200	2300		Namibia, Namibian BC Corp	3270af	3289af		
2200	2300		Netherlands, Radio	6175na	9590na		
2200	2300		New Zealand, ZLXA	3935do	7290do		
2200	2300	vi	Nigeria, Radio/Enugu	6025do			
2200	2300	vi	Nigeria, Radio/Ibadan	6050do			
2200	2300	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
2200	2300	vi	Nigeria, Radio/Lagos	3326do			
2200	2300		Nigeria, Voice of	7255af	11770af	15120na	
2200	2300	vi	Solomon Islands, SIBC	5020do	9545do		
2200	2300		Sri Lanka, Sri Lanka BC Corp	4940irr			
2200	2300		Taiwan, Radio Taipei International	11565eu	15600eu		
2200	2300		Turkey, Voice of	7190va	11845va		
2200	2300		UK, BBC World Service	5965as	5975am	6195na	7105as
2200	2300		11835af	11955as	12095sa	15400af	9660as
2200	2300		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
			6350va	6458va	6847va	10320va	10940va
			13254va	13362va	16847va	12579va	12689va
2200	2300		USA, KAJI Dallas TX	13815va			
2200	2300		USA, KTBN Salt Lake City UT	15590na			
2200	2300		USA, KWHR Naalehu HI	17510as			
2200	2300		USA, Voice of America	7215as	9705as	11760as	15185as
			15290as	15305as	17740as		
2200	2300	mtwhf	USA, WBCQ Monticello ME	7415na	9330na		
2200	2300	a	USA, WBCQ Monticello ME	9330na	17494na		
2200	2300		USA, WEWN Birmingham AL	9385na	9975eu	13615na	
2200	2300		USA, WHRA Greenbush ME	7580eu			
2200	2300		USA, WHRI Noblesville IN	5745va	9495am		
2200	2300		USA, WINB Red Lion PA	13570am			
2200	2300		USA, WJCR Upton KY	7490am			
2200	2300	as	USA, WRMI Miami FL	9955am			

2200	2300	USA, WRNO New Orleans LA	7395am	15420al		
2200	2300	USA, WSHB Cypress Crk SC	13770eu	15285sa		
2200	2300	USA, WTJC Newport NC 9370na				
2200	2300	USA, WWCR Nashville TN	7435na	9475na	12160na	13845na
2200	2300	USA, WWFV McCaysville GA	5085va	12172va		
2200	2300	Vanuatu, Radio	3945do	4960do	7260do	
2200	2300	Zambia, Christian Voice 4965do				
2205	2230	Italy, RAI International	9675as	11900as	15265as	
2216	2300	New Zealand, R New Zealand Int	17675pa			
2230	2257	Czech Rep, Radio Prague Intl	11600na	15445na		
2230	2300	Belgium, RVI Flanders R Intl	15565na			
2230	2300	Canada, R Canada International	9755am	13670am	17695am	
2230	2300	Cuba, Radio Havana	9550am			
2230	2300	Papua New Guinea, NBC	4890do	11880irr		
2245	2300	India, All India Radio	9705as	9950as	11620as	13605as
2245	2300	USA, WYFR Okeechobee FL	11740na			

## 2300

2300	0000		Anguilla, Caribbean Beacon	6090am			
2300	0000		Australia, ABC/Alice Springs	4835do			
2300	0000	vl	Australia, ABC/Katherine	5025do			
2300	0000	vl	Australia, ABC/Tennant Creek	4910do			
2300	0000		Bulgaria, Radio	11700na			
2300	0000	vl	Cameroon, CRTV Radio Buea	6005do			
2300	0000		Canada, CBC Northern Service	9625do			
2300	0000		Canada, CFRX Toronto ON	6070do			
2300	0000		Canada, CFVP Calgary AB	6030do			
2300	0000		Canada, CHNX Halifax, NS	6130do			
2300	0000		Canada, CKZN St John's NF	6160do			
2300	0000		Canada, CKZU Vancouver BC	6160do			
2300	0000		China China Radio International	5990na			
2300	0000		Costa Rica, R for Peace Intl	15050va	21815usb		
2300	0000		Costa Rica, University Network	5030am	6150am	7375am	9925sa
			11870am 13749na 17645as				
2300	0000		Ecuador, HCJB	17660as			
2300	0000		Egypt, Radio Cairo	9900am			
2300	0000	f/monthly	Finland, Scandv Weekend Radio	5990va	11720va		
2300	0000	vl	Ghana, Ghana BC Corp	3366do	4915do		
2300	0000		India, All India Radio	9705as	9950as	11620as	13605as
2300	0000	vl	Liberia, R Liberia International	5100do			
2300	0000		Malaysia, Radio	7295do			
2300	0000		Malaysia, RTM Kota Kinabalu	5980do			
2300	0000		Namibia, Namibian BC Corp	3270af	3289af		
2300	0000		Netherlandss, Radio	6175na	9590na		
2300	0000		New Zealand, R New Zealand Int	17675pa			
2300	0000		New Zealand, ZLXA	3935do	7290do		
2300	0000	vl	Papua New Guinea, NBC	4890do	11880irr		
2300	0000		Singapore, SBC Radio One	6150do			
2300	0000	vl	Solomon Islands, SIBC	5020do	9545do		
2300	0000		Sri Lanka, Sri Lanka BC Corp	4940do			
2300	0000		UK, BBC World Service	3915as	5965as	5975am	6035as
			7105as 11945as 11955as	12095sa	15280as		6195as
2300	0000		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
			6350va 6458va 6847va	10320va	10940va	12579va	12689va
			13254va 13362va 16847va				
2300	0000		USA, KAJI Dallas TX	13815va			
2300	0000		USA, KTBN Salt Lake City UT	15590na			
2300	0000		USA, KWHR Naalehu HI	17510as			
2300	0000		USA, VOA Special English	11925as 13735as 13775as	7190as	7200as	9545as
			15205pa				11805pa
2300	0000		USA, Voice of America	7215as	9705as	9770as	11760as
			15290as 15305as 17740as	17820as			15185as
2300	0000		USA, WBCQ Monticello ME	7415na			
2300	0000	mtwhf	USA, WBCQ Monticello ME	9330na			
2300	0000	a	USA, WBCQ Monticello ME	17494na			
2300	0000		USA, WEWN Birmingham AL	9385na	9975eu	13615na	
2300	0000		USA, WHRA Greenbush ME	7580eu			
2300	0000		USA, WHRI Noblesville IN	5745va	9495am		
2300	0000		USA, WINB Red Lion PA	13570am			
2300	0000		USA, WJCR Upton KY	7490am			
2300	0000		USA, WRMI Miami FL	9955am			
2300	0000		USA, WRNO New Orleans LA	7355va			
2300	0000		USA, WSHB Cypress Crk SC	13770eu	15285sa		
2300	0000		USA, WTJC Newport NC 9370na				
2300	0000	as	USA, WWBS Macon GA 11910na				
2300	0000		USA, WWCR Nashville TN	7435na	9475na	12160na	13845na
2300	0000		USA, WWFV McCaysville GA	5085va	6890va		
2300	0000	vl	Vanuatu, Radio	3945do	4960do	7260do	
2300	0000		Zambia, Christian Voice 4965do				
2300	2305	vl	Nigeria, Radio/Enugu	6025do			
2300	2305	vl	Nigeria, Radio/Ibadan	6050do			
2300	2305	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
2300	2305	vl	Nigeria, Radio/Lagos	3326do	4990do		
2300	2330		Australia, Radio	9660pa	11880as	12080va	15240as
			17795va 21740va				17715va
2300	2330	mtwhf	Canada, R Canada International	6040am	11865am	15305am	
2300	2330		Cuba, Radio Havana	9550am			
2300	2330	mtwhf	Mexico, R Mexico International	9705am	11770am		
2300	2345		Germany, Deutsche Welle	9815as	12055as	13610as	21790as
2300	2345		USA, WYFR Okeechobee FL	11740na			
2300	2356		Romania, R Romania International	9750eu	11775eu	11940na	15105na
2300	2359		Canada, R Canada International	9755am	13670am	17695am	
2305	2310		Croatia, The Voice of Croatia	9925sa			
2330	0000		Australia, Christian Voice	9865pa	17850as		
2330	0000		Australia, Radio	9660pa	11695as	12080va	15415as
			17715va 17795va 21740va				
2330	0000		Malaysia, RTM Sarawak	7160do			
2330	0000		Netherlands, Radio	6165na	9845na		
2330	0000		Switzerland, Swiss R International	9885sa	11905sa		
2330	0100		Lithuania, Radio Vilnius	9875na			
2330	2345	vl	Libya, Voice of Africa	11815af	15435af	17725af	
2330	2357		Vietnam, Voice of	12019as	15115as		



## BBCWS AMERICAS STREAM

This month's program listings include only the BBC World Service Americas stream. For other streams, please refer to August's *SWG*. **BBCWS(am)** is on shortwave at these times and on these frequencies reported by listeners as audible in North America: 1000-1400 on 6195; 1100-1400 on 15220; 1400-1700 on 17840; 2100-0200 on 12095; 0000-0100 on 11810; 0000-0300 on 9915; 0100-0400 on 11835; 2100-0500 on 5975.

### 0000 UTC - Page 43 Freqs

#### Sunday

- 0000 R. Netherlands Aural Tapestry (David Swatling weaves threads from different cultures and periods of history to tell interesting stories)  
WBCQ(7415kHz)  
0005 R. Australia The Europeans (historical and cultural perspectives on European societies)  
R. Prague Readings from Czech Literature  
0010 R. Japan Hello from Tokyo (listener letters, music and short features)  
R. Prague Saturday Music (Czech classical, folk, jazz or rock music)  
R. New Zealand Int. The Week in Parliament (a weekly roundup of NZ political news)  
0030 BBCWS(am) Arts in Action (a global arts magazine)  
R. Netherlands Roughly Speaking (European youth lifestyles magazine)  
R. New Zealand Int. Spectrum (a weekly look at the people, places and events around NZ)

#### Monday-Friday

- 0000 R. New Zealand Int. Midday Report (news updates and in-depth reports)

#### Monday

- 0000 R. Netherlands Dutch Horizons (Bertine Krol chronicles life in Holland)  
WBCQ(7415kHz)  
0010 R. Australia Radio New York Int'l (Johnny Lightning plays classic rock)  
Wayel! (Produced and presented by Aboriginal broadcasters, this is Australia's only national indigenous arts and culture program)  
R. Japan Weekend Square (A program designed to present various aspects of Japan in a friendly and relaxed atmosphere with interviews, music and discussions)  
0030 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)  
R. Netherlands Aural Tapestry (David Swatling weaves threads from different cultures and periods of history to tell interesting stories.)  
0045 R. Exterior de Espana Radio Club (a repeat of Saturday's 0035 program.)

#### Tuesday-Saturday

- 0000 R. Exterior de Espana REE's News Service (featuring international, Ibero-American and national news in-depth, a review of the Spanish press, commentaries and analyses)  
VOA News Now (the VOA's continuous rolling news service with analysis, sports, business reports and topical features)  
0015 R. Japan 44 Minutes (daily current affairs magazine about Japan and Asia)  
0045 R. Exterior de Espana Spanish Language Course

#### Tuesday

- 0000 R. Netherlands The Research File (a magazine emphasizing the relevance of science to all our lives)  
WWCR(9475kHz)  
0005 BBCWS(am) Keen on Jazz  
Meridian-Masterpiece (critical examinations of creative endeavors) [The last program in Aug. and the first this month looks at the Edinburgh Festival]  
0010 R. Australia The Science Show (one of the longest running programs on ABC Radio)  
0030 BBCWS(am) The Music Mix (insights into current popular music)  
R. Netherlands EuroQuest (a magazine placing Europe in context)  
0033 VOA News Now Encounter (current events debate and discussion)

#### Wednesday

- 0000 R. Netherlands Music 52/15 (Martha Hawley presents musical styles from around the globe)  
0005 BBCWS(am) Meridian-Screen (interviews, documentaries, features and discussions on the film arts)  
0010 R. Australia The National Interest (Terry Lane's round-up of the week's major issues)  
0030 BBCWS(am) Top Twenty (music from the British rock and pop charts)  
R. Netherlands A Good Life (how development affects societies)  
0033 VOA News Now Our World (the VOA's science, technology and environment magazine)

#### Thursday

- 0000 R. Netherlands The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)

- WBCQ(7415kHz)  
BBCWS(am)  
0010 R. Australia Background Briefing (ABC Radio's award-winning agenda-setting, current affairs radio documentary program)  
0030 BBCWS(am) Westway (a twice-weekly radio soap opera)  
R. Canada Int. Dispatches (In-depth reports offering a Canadian perspective on international news topics)  
R. Netherlands Dutch Horizons (Bertine Krol chronicles life in Holland)  
0033 VOA News Now Kaleidoscope (the VOA's arts and culture magazine)  
0045 BBCWS(am) UK Album Chart (music from Britain's most popular CDs)

#### Friday

- 0000 R. Netherlands Talking It Over (Chris Chambers interviews well-known people who are Dutch or who have lived in Holland for many years)  
0005 BBCWS(am) Meridian-Writing (reports on books, theatre, poetry, journalism, biography, history and anthropology)  
0010 R. Australia Hindsight (Australian social history woven from the memories of those who were there)  
0015 R. Netherlands From Sapphire to Laser (Rob Green's classical music series first broadcast in the mid-'90s)  
0030 BBCWS(am) Charlie Gillett (presents his selection of music from around the globe)  
R. Netherlands The Research File (a magazine emphasizing the relevance of science to all our lives)  
0033 VOA News Now Best of 'Talk to America' (excerpts from previous editions of this VOA listener phone-in)

#### Saturday

- 0000 R. Netherlands A Good Life (how development affects societies)  
R. New Zealand Int. RNZ News  
WBCQ(7415kHz)  
0005 BBCWS(am) Allan Weiner Worldwide (the station manager's show)  
Omnibus (a weekly documentary feature program that tackles any topic across the globe)  
R. Australia Feedback (Roger Broadbent answers listener questions and provides regular updates about RA)  
0010 R. New Zealand Int. Focus on Politics (a report on government and politics in NZ)  
0030 BBCWS(am) Westway (a radio soap opera)  
R. Australia Country Breakfast (an entertaining look at Australian rural and regional issues with Belinda Varischetti)  
R. New Zealand Int. The Sampler (Nick Bollinger casts a critical ear over the latest CD offerings)  
R. Netherlands The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)  
0033 VOA News Now Press Conference USA ('Meet the Press' for shortwave)  
0035 R. Exterior de Espana Radio Club (answering listeners' letters)  
0045 BBCWS(am) Revolver (a guest musical artist gives a personal view on a selection of the best new releases from country to techno)  
R. Exterior de Espana Radio Waves (a weekly program for radio enthusiasts)

### 0100 UTC - Page 43 Freqs

#### Daily

- 0130 R. Austria Int. Report from Austria (a daily magazine focusing on Austria and central and eastern Europe)

#### Sunday

- 0100 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)  
WBCQ Marion's Attic (rare and vintage recordings presented by Marion Webster)  
0105 Deutsche Welle Talking Point (European journalists discuss the week's events)  
R. Australia Correspondents' Report (ABC News reporters background international events)  
R. Canada Int. Canada Newsweek (the past week in Canada)  
R. Netherlands Wide Angle (a weekly in-depth look at a news topic)  
R. New Zealand Int. The Film Show (a weekly report on cinema with Jonathan Dennis)  
R. Prague Readings from Czech Literature  
0110 HCB Ecuador DX Partyline (Allen Graham hosts a weekly program for DXers and SWLs)  
R. Prague Saturday Music (Czech classical, folk, jazz or rock music)  
Swiss R. Int. The Name Game (prizes are offered to listeners who can identify the mystery Swiss location described) [1st Sun. of the month]

- 0111 Voice of Russia News and Views (Russian views on news developments)  
0115 Deutsche Welle Inside Europe (a weekly magazine exploring the topical issues shaping the continent)  
0120 China R. Int. In the Spotlight (Chinese arts and cultural magazine)  
0130 BBCWS(am) Reporting Religion (the week's religion news)  
R. Australia Oz Sounds (Australian new music releases)  
R. Canada Int. Canada Review (a business and technology edition of RCI's weekend magazine)  
R. New Zealand Int. Bookmarks (NZ books, literature and writers)  
RTE Ireland Sportsnews (reports and accounts on the weekend's events)  
0132 Voice of Russia Moscow Yesterday and Today (recalling the most interesting events in the history of the city)  
0135 R. Austria Int. Radio E (A weekly magazine on Europe jointly produced by the BBC and other European broadcasters.)  
0140 R. Habana Cuba DXers Unlimited (Amie Coro presents a program from radio enthusiasts)  
Swiss R. Int. (repeat broadcast of the 0110 program)  
0145 BBCWS(am) Letter from America (Alistair Cooke's weekly commentary on life in the USA)

#### Monday-Friday

- 0105 R. New Zealand Int. Cadenza (light classical music selections)  
0110 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)

#### Monday

- 0100 R. Habana Cuba Weekly Review (Cuba's perspective on current events)  
WBCQ(7415kHz.) Radio New York International (continues from 0000)  
0105 BBCWS(am) Wright Around the World (Steve Wright puts the best e-mails, letters, answer machine messages and faxes on the air while playing musical requests)  
Deutsche Welle Religion and Society (an insight into religious events around the world)  
R. Budapest Spotlight (a monthly magazine)[9th]  
Europe Unlimited (Hungary's relations with the rest of Europe)[16th]  
Heading for Hungary (a monthly travelogue)[24th]  
And the Gatepost (listener letters)[30th]

#### R. Canada Int.

- The Maple Leaf Mailbag (Mark Montgomery answers listener mail and hosts the fortnightly CIOX Report for dxers)  
R. Netherlands Wide Angle (a single issue examined in-depth)  
0115 Deutsche Welle Arts on the Air (Breandain O'Shea covers the German cultural scene.)

#### 0130 China R. Int.

- People in the Know (interviews with prominent Chinese who are shaping the nation's future)  
R. Australia The Health Report (Dr. Norman Swan's weekly report on health and medical issues)  
R. Canada Int. Canada Review (the arts edition of RCI's weekend magazine)  
R. Habana Cuba 40th Anniversary of RHC (special reports on the history of the station)

#### RTE Ireland

- Sportsnews (reports and accounts on the weekend's events)  
0132 Voice of Russia Timelines (Estelle Winters' variety show giving insight into life in Moscow through foreign eyes)  
0140 R. Habana Cuba The Mailbag Show (listener letters)  
0150 R. Habana Cuba Breakthrough (Amie Coro's weekly science report)

#### Tuesday-Saturday

- 0100 R. Exterior de Espana REE's News Service (featuring international, Ibero-American and national news in-depth, a review of the Spanish press, commentaries and analyses)  
R. Netherlands Newsline (news, analysis and background reports)  
VOA News Now (the VOA's continuous rolling news service with analysis, sports, business reports and topical features)  
0105 Deutsche Welle Newslink (daily current affairs magazine focused on Europe)  
0110 R. Budapest Hungary Today (daily magazine covering current events in Hungary)  
R. Canada Int. Canada Today (daily magazine of interviews, correspondents' reports and Canadian views on world and national events)  
Voice of Russia Commonwealth Update (comments on domestic developments and major domestic issues)  
0110 HCB Ecuador Studio 9 (daily magazine with focused reports on Latin America)  
0130 RTE Ireland The News at Six (RTE's flagship evening news program)  
0145 R. Exterior de Espana Spanish Language Course

#### Tuesday

- 0105 BBCWS(am) Health Matters (reports on the latest research explaining where medicine is going)  
0130 China R. Int. Sports World (comprehensive coverage of sports in China and Asia)  
Deutsche Welle Insight (a look at major international trends and developments)  
0130 R. Australia The Law Report (Damien Carrick presents breaking legal stories in Australia and overseas)  
0132 Voice of Russia Folk Box (music drawn from the traditions of the hundreds of nationalities that make up Russia and the CIS)

#### Wednesday

- 0105 BBCWS(am) Go Digital (technology journalist Tracey Logan explains the latest in IT)  
0130 BBCWS(am) Focus on Faith (Trevor Barnes looks at the religious stories behind the news.)







Deutsche Welle Man and Environment (John Hay presents the human element in environmental issues.)  
 R. Australia The Religion Report (Lyn Gallacher examines the way religion and societies interact)  
 0132 Voice of Russia The Jazz Show (retransmits from the Russian world of jazz)  
 0140 R. Habana Cuba DXers Unlimited (Arnie Caro presents a program from radio enthusiasts.)

**Thursday**

0105 BBCWS(am) Sports International (the issues and personalities behind the headlines)  
 0130 BBCWS(am) Pick of the World (Daire Brehan presents World Service highlights and talks with the producers and presenters of BBC programs)  
 Deutsche Welle Living in Germany (people, places and events in Germany)  
 HCJB Ecuador Ham Radio Today (Graham Bulmer hosts a program for radio amateurs.)  
 R. Australia The Media Report (Mick O'Regan takes a critical look at the latest developments in the communications industry)

**Friday**

0105 BBCWS(am) One Planet (stories about the environment, development, agriculture and human impact on the natural world) [This month: the last three programs in the series *The Lie of the Land - commercial, social and political pressures that influence land use*]  
 0115 Deutsche Welle Hard to Beat—The World of Sport (weekly report on German and European sport)  
 0130 BBCWS(am) People and Places (a forum for the exchange of views and experiences on a global scale) [This month: the last two interviews in the series *About Face*]  
 0130 R. Australia The Sports Factor (Amanda Smith presents reports which debate and celebrate the cultural significance of sport)

**Saturday**

0100 WBCQ(7415kHz) Tasha Takes Control (upbeat progressive music)  
 0105 BBCWS(am) Discovery (in-depth exploration of ideas and discoveries in science and technology)  
 0105 R. Australia Asia-Pacific Weekend Edition (a weekly current events and business report for and about Asia and the Pacific region)  
 0110 R. New Zealand Int. Home Grown (Liz Barry plays contemporary Kiwi music)  
 0130 BBCWS(am) Essential Guide (the biggest developments, issues and names in global affairs) [This month: the last two programs in the series *Gene Pioneers - Peter Evans in conversation with scientists leading the genetic revolution*]  
 Deutsche Welle German by Radio (a language lesson)  
 HCJB Ecuador Musica del Ecuador (Jorge Zambrano presents selections of Ecuadorian and Andean music)  
 R. Australia Arts Talk (Julie Copeland presents the world of arts and cultural ideas)  
 R. New Zealand Int. Musical Chairs (the music and background of a featured NZ musician)  
 WBCQ(7415kHz) Ken's Country Classics (classic country music)  
 0133 VOA Communications World (Kim Elliott reviews the week in global communications)  
 0135 R. Exterior de Espana Radio Club (answering listeners' letters)  
 0145 R. Exterior de Espana Radio Waves (a weekly program for radio enthusiasts)  
 VOA Special English American Stories (short stories by American authors)

**0200 UTC - Page 43 Freqs****Sunday**

0200 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)  
 HCJB Ecuador Ham Radio Today (Graham Bulmer hosts a program for radio amateurs.)  
 WBCQ(7415kHz) Magic Radio (entertainment variety show)  
 WBCQ(5070kHz) Communications World (Kim Elliott reviews the week in global communications)  
 0205 R. Australia Margaret Throsby (A guest is interviewed and presents favorite musical pieces)  
 0205 R. New Zealand Int. Eureka! (reports on science in NZ)  
 0211 Voice of Russia Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow.)  
 0215 R. Taipei Int. Great Wall Forum (the China-Taiwan issue from Taipei's perspective)  
 0230 BBCWS(am) From Our Own Correspondent (the background to international events from BBC correspondents around the world)  
 R. New Zealand Int. Health Matters or Environment Matters  
 R. Sweden Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)  
 Sweden Today (George Wood presents the voices of Sweden, the second week of the month)  
 Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)  
 Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)  
 WRMI(7385kHz) Viva Miami (R. Miami International's listener magazine show)  
 WBCQ(5070kHz) World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)  
 0232 Voice of Russia Songs from Russia (melodies and musical novelties from

0235 R. Habana Cuba Russia's past)  
 The World of Stamps (This just might be the only program on radio on philatelic matters.)  
 0240 Swiss R. Int. The Name Game (prizes are offered to listeners who can identify the mystery Swiss location described) [1st Sun. of the month]  
 0245 R. Habana Cuba 40th Anniversary of RHC (special reports on the history of the station)

**Monday-Friday**

0205 R. New Zealand Int. In Touch with New Zealand (a domestic afternoon variety program hosted by Wayne Mowat; this hour includes popular music set to a theme)  
 0210 R. Australia The World Today (a comprehensive current affairs program with Monica Attard and John Highfield)  
 0245 R. Taipei Int. Let's Learn Chinese

**Monday**

0200 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)  
 Radio New York International (continues from 0000)  
 Keen on Jazz  
 0210 R. Habana Cuba From Havana (a showcase of contemporary Cuban music and musicians)  
 0211 Voice of Russia Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow)  
 0215 R. Taipei Int. Jade Bells and Bamboo Pipes (Carson Wong introduces selections of traditional Chinese music)  
 0230 BBCWS(am) Assignment (documentaries that delve behind the headlines to find out how news events affect people's everyday lives)  
 R. Habana Cuba The Jazz Place (the very best of Cuban jazz)  
 R. Sweden In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström)

0200 WBCQ(7415kHz)  
 0210 WBCQ(3215kHz)  
 0211 R. Habana Cuba  
 0215 Voice of Russia  
 0215 R. Taipei Int.  
 0230 BBCWS(am)  
 0235 R. Habana Cuba  
 0235 R. Sweden

WRMI(7385kHz)

0232 Voice of Russia

0235 R. Budapest

**Tuesday-Saturday**

0230 R. Sweden Sixty Degrees North (reports, interviews and analysis on the Nordic region)  
 0230 BBCWS(am) World Business Report (a guide through the main business issues of the day)  
 0235 R. Budapest Hungary Today (a daily magazine covering current events in Hungary)

**Tuesday**

0211 Voice of Russia Science and Engineering (reports on the latest developments in science and technology)  
 0232 Voice of Russia Kaleidoscope (the latest economic, social and cultural events in Russia and the CIS)  
 0245 BBCWS(am) Analysis (background to the stories in the news)

**Wednesday**

0200 HCJB Ecuador The Book and the Spade (the latest discoveries and developments in Biblical archaeology)  
 0211 Voice of Russia Newmarket (news about business in Russia and Russia's involvement in international business)  
 0245 BBCWS(am) Analysis (background to the stories in the news)  
 0245 R. Sweden Close Up (profiles of people in Sweden from all walks of life)

**Thursday**

0211 Voice of Russia Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow.)  
 0215 R. Taipei Int. Journey into Chinese Culture  
 0232 Voice of Russia Moscow Yesterday and Today (recalling the most interesting events in the history of the city)  
 0245 BBCWS(am) From Our Own Correspondent (the background to international events from BBC correspondents around the world)  
 0245 R. Sweden Money Matters (a weekly economic report on the Nordic region)

**Friday**

0211 Voice of Russia Science and Engineering (reports on the latest developments in science and technology)  
 0232 Voice of Russia Russian by Radio (a language lesson)  
 0245 BBCWS(am) Analysis (background to the stories in the news)  
 0245 R. Sweden Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)  
 Greenscan (Azariah Kiro highlights Swedish environmental awareness and challenges the second week of the month)  
 Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)

The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)

**Saturday**

0200 WBCQ(3215kHz) World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)  
 0205 R. New Zealand Int. Home Grown (continues from 0110)  
 0210 R. Australia Background Briefing (ABC Radio's award-winning agenda-setting, current affairs radio documentary program)  
 0211 Voice of Russia Newmarket (news about business in Russia and Russia's involvement in international business)  
 0232 Voice of Russia Audio Book Club (readings from the best of Russian classic and contemporary literature)  
 0245 BBCWS(am) Analysis (background to the stories in the news)

**0300 UTC - Page 44 Freqs****Sunday**

0300 WHRI(5745kHz) Diving with Cumbre (Marie Lamb with the hottest DX catches)  
 WBCQ(5070kHz) Spectrum (communications magazine/phone-in)  
 0305 R. Australia Feedback (Roger Broadbent answers listener questions and provides regular updates about RA)  
 R. Prague Readings from Czech Literature  
 0310 R. Prague Saturday Music (Czech classical, folk, jazz or rock music)  
 0315 Deutsche Welle Spectrum (a weekly program looking at developments in the fields of science and technology)  
 0320 China R. Int. In the Spotlight (Chinese arts and cultural magazine)  
 0330 BBCWS(am) Science in Action (Richard Black reports news from the worlds of science and technology)  
 R. Australia Ockham's Razor (sharp commentaries on scientific issues)  
 R. Sweden Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)  
 Sweden Today (George Wood presents the voices of Sweden, the second week of the month)  
 Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)  
 Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)  
 This Lousy Half Hour Show (Charlie Kaufman with an eclectic variety of music)  
 WRMI(7385kHz) Kaleidoscope (the latest economic, social and cultural events in Russia and the CIS)  
 0332 Voice of Russia DXers Unlimited (Arnie Caro presents a program from radio enthusiasts)

**Monday**

0300 R. Habana Cuba Weekly Review (Cuba's perspective on current events)  
 WBCQ(7415kHz) Radio New York International (continues from 0000)  
 0305 BBCWS(am) Counterpoint (Ned Sherrin presents a general knowledge music quiz)  
 R. New Zealand Int. Tagata o te Moana (Anita Purcell presents a weekly Pacific magazine with NZ and regional Pacific news, issues, information and music.)  
 0315 Deutsche Welle Arts on the Air (Breandain O'Shea covers the German cultural scene.)  
 0330 BBCWS(am) Westway Omnibus (an opportunity to hear again both episodes of this radio drama serial broadcast last week)  
 China R. Int. People in the Know (interviews with prominent Chinese who are shaping the nation's future)  
 R. Habana Cuba 40th Anniversary of RHC (special reports on the history of the station)  
 R. Sweden In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström)  
 Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first)  
 WBCQ(5070kHz) The Old Record Shop (vintage recordings)  
 0332 Voice of Russia Audio Book Club (readings from the best of Russian classic and contemporary literature)  
 0340 R. Australia The Australian Music Show (the latest rock music from the Triple J youth network of the ABC)  
 R. Habana Cuba The Mailbag Show (listener letters)  
 0350 R. Habana Cuba Breakthrough (Arnie Caro's weekly science report)

**Tuesday-Saturday**

0305 Deutsche Welle Newslink (daily current affairs magazine focused on Europe)  
 0311 Voice of Russia News and Views (Russian views on news developments)  
 0330 R. Sweden Sixty Degrees North (reports, interviews and analysis on the Nordic region)  
 0345 BBCWS(am) Off the Shelf (abridged serialized readings of novels, stories and other literature)

**Tuesday**

0305 BBCWS(am) Brain of Britain 2001 (the return of Robert Robertson and his popular nationwide quiz)  
 R. New Zealand Int. Top Five and New Releases (the top five singles and new music releases in NZ with Greg Tartere)  
 0315 Radio Taipei Int. Taiwan Economic Journal  
 0330 China R. Int. Sports World (the sports scene in China and Asia)  
 Deutsche Welle Insight (a look at major international trends and developments)

# Shortwave Guide



0340 R. Australia Music Deli (Australian performances of folk, acoustic, traditional and world music)

**Wednesday**

0305 BBCWS(am) John Peel (an eclectic mix of music)

R. New Zealand Int. Pacific Report (RNZI correspondent Don Wiseman interviews and reports on regional matters)

0330 BBCWS(am) Patterns of Faith (a global exploration of religious values and human wisdom)

Deutsche Welle Man and Environment (John Hay presents the human element in environmental issues.)

R. New Zealand Int. Tradewinds (Walter Zweifel with a weekly report on Pacific regional business and economic news and features)

0340 R. Australia Blacktracker (Mal Honess presents contemporary Aboriginal music)

R. Habana Cuba DXers Unlimited (Amie Coro presents a program from radio enthusiasts)

0345 R. Sweden Close Up (profiles of people in Sweden from all walks of life)

**Thursday**

0305 BBCWS(am) The Greenfield Collection (Edward Greenfield plays classical music requests and selections drawn from his own collection)

R. New Zealand Int. RNZI Talk (a fortnightly introduction to the RNZI and National Radio staff, along with RNZI developments, projects and programmes)

Mailbox (a fortnightly program aimed at the serious shortwave listener, with Myra Oh answering letters, Paul Ormonday reporting the latest DX news, and Frequency Manager Adrian Sainsbury answering technical questions)

0330 Deutsche Welle Living in Germany (people, places and events in Germany)

R. New Zealand Int. The World in Sport (Dimitri Edwards presents highlights of the world's sporting week with emphasis on NZ and the Pacific.)

0340 R. Australia Oz Country Style (country music from Australia)

0345 R. Sweden Money Matters (a weekly economic report on the Nordic region)

**Friday**

0305 BBCWS(am) Jazzmatazz (a weekly jazz magazine)

R. New Zealand Int. Dateline Pacific (the major Pacific stories of the week, with background and reaction from the people making the news, presented by Don Wiseman)

0330 BBCWS(am) Heart and Soul (global religious and spiritual experiences) [This month: Why Do Writers Write? - Rosemary Hartill in a series of six conversations with international authors with different religious beliefs who offer insight into their creative processes]

China R. Int. Life in China (a weekly magazine focusing on the lives of ordinary people in China)

Deutsche Welle Hard to Beat: The World of Sport (weekly report on German and European sport)

R. New Zealand Int. Pacific Correspondent (RNZI's regional correspondents talk to Don Wiseman about political and social issues in their respective Pacific countries)

0340 R. Australia Jazz Notes (Australian jazz presented by Ivan Lloyd)

0345 R. Sweden Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)

Greenscan (Azariah Kiro highlights Swedish environmental awareness and challenges the second week of the month)

Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)

The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)

**Saturday**

0305 BBCWS(am) Composer of the Month (the life, career and music of a selected composer)

R. Australia Rural Reporter (ABC's rural reporters present news and stories from rural and regional Australia)

R. New Zealand Int. Music feature or series

0330 BBCWS(am) Write On (Penny Vine sifts through the listener mail)

From Where I Stand (audio diaries about modern British society) [aired the second or third week of the month in place of Write On]

Deutsche Welle German by Radio (a language lesson)

HCB Ecuador Inspirational Classics (classical music selections inspired by religious and spiritual themes)

R. Australia Educational series (a series of documentary programs dealing with Asian or Pacific history, politics or communications. Specific details were unavailable at deadline)

## 0400 UTC - Page 44 Freqs

**Daily**

0400 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)

**Sunday**

0400 R. Vlaanderen Int. Music from Flanders (a half-hour of Flemish music, musicians and musical performances)

WRMI(7385kHz) Scream of the Butterfly (Johnny Rockin feature rare and interesting rock music from the '60s and '70s)

0405 R. Australia Pacific Focus-Arts (reports on culture and the arts in the Pacific region)

R. New Zealand Int. Playhouse (classic and contemporary radio drama)

0410 HCB Ecuador DX Parlyline (Allen Graham hosts a weekly program for DXers and SWLs)

0415 Swiss R. Int. The Name Game (prizes are offered to listeners who can identify the mystery Swiss location described) [1st Sun. of the month]

0420 China R. Int. In the Spotlight (Chinese arts and cultural magazine)

0430 BBCWS(am) Global Business (Peter Day charts the transformations sweeping through the world of work and commerce.)

R. Australia Arts Talk (Julie Copeland presents the world of arts and cultural ideas)

WHRI(5745kHz) Doing with Cumbre (Marie Lamb with the hottest DX catches)

0432 Voice of Russia Moscow Yesterday and Today (recalling the most interesting events in the history of the city)

0435 R. Habana Cuba The World of Stamps (This just might be the only program on radio on philatelic matters)

R. Netherlands Europe Unzipped (the events of the past week in Europe, some unusual)

0445 R. Habana Cuba 40th Anniversary of RHC (special reports on the history of the station)

Swiss R. Int. (repeat of the 0415 program)

0455 R. Netherlands Insight (Rob Green casts a critical and humorous eye on the past week's headlines)

**Monday-Friday**

0400 WBCQ Amos 'n Andy (the classic radio comedy from America's radio past)

0405 R. New Zealand Int. In Touch with New Zealand (continues from 0205, this hour including a daily report from one of NZ's regions)

0410 R. Australia Margaret Throsby (a guest is interviewed and presents favorite musical pieces)

**Monday**

0400 R. Vlaanderen Int. Radio World (Frans Vassen presents a weekly report about international radio)

WBCQ(7415kHz) Tom and Darryl (discussions about satellite, shortwave, LPFM and Internet communications)

0410 R. Habana Cuba From Havana (a showcase of contemporary Cuban music and musicians)

0430 China R. Int. People in the Know (interviews with prominent Chinese who are shaping the nation's future)

R. Habana Cuba The Jazz Place (the very best of Cuban jazz)

0432 Voice of Russia The Jazz Show (recordings from the Russian world of jazz)

0435 R. Netherlands Sincerely Yours (Howard Shannon and Neville Powis host RN's listener response program.)

0455 R. Netherlands The Week Ahead (on RN the next seven days)

**Tuesday-Saturday**

0410 HCB Ecuador Studio 9 (daily magazine with focused reports on Latin America)

0430 R. Netherlands Newsline (news, analysis and background reports)

**Tuesday**

0411 Voice of Russia Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow)

0430 China R. Int. Sports World (the sports scene in China and Asia)

**Wednesday**

0411 Voice of Russia Science and Engineering (reports on the latest developments in science and technology)

**Thursday**

0411 Voice of Russia Newmarket (news about business in Russia and Russia's involvement in international business)

0430 HCB Ecuador Ham Radio Today (Graham Bulmer hosts a program for radio amateurs.)

0432 Voice of Russia Folk Box (music drawn from the traditions of the hundreds of nationalities that make up Russia and the CIS)

**Friday**

0411 Voice of Russia Moscow Mailbag (See Tuesday's 0511 listing.)

0430 China R. Int. Life in China (a weekly magazine focusing on the lives of ordinary people in China)

0432 Voice of Russia Audio Book Club (readings from the best of Russian classic and contemporary literature)

**Saturday**

0400 WBCQ Amos 'n Andy (the classic radio comedy from America's radio past)

0405 R. Australia Pacific Focus-Environment (the past week's environmental news as reported on the weekday magazine, Pacific Beat)

R. New Zealand Int. Tagata o te Moana (Anita Purcell presents a weekly Pacific magazine with NZ and regional Pacific news, issues, information and music)

0411 Voice of Russia Science and Engineering (reports on the latest developments in science and technology)

0430 HCB Ecuador Musica del Ecuador (Jorge Zambrano presents selections of Ecuadorian and Andean music)

R. Australia The Buzz (the week's big technology news and issues presented by Richard Aedy)

0432 Voice of Russia Timelines (Estelle Winters' variety show giving insight into life in Moscow through foreign eyes)

## 0500 UTC - Page 45 Freqs

**Sunday**

0500 R. Netherlands Aural Tapestry (David Swarling weaves threads from different cultures and periods of history to tell interesting stories.)

WRMI(7385kHz) Seldom Heard Radio (obscure folk, folk rock and psychedelic music)

0505 Deutsche Welle Talking Point (European journalists discuss the week's events.)

R. Australia Pacific Focus-Sports (reports on sport in the Pacific region)

R. New Zealand Int. Whenua! (Maori cultural magazine)

0510 R. Japan Pop! Goes Asia (a look at Asia as it is now, presenting the cultures and lifestyles of other Asian countries through their popular music)

R. New Zealand Feature on religion

0515 Deutsche Welle Marks and Markets (DW's weekly financial magazine highlighting business in Europe)

0520 China R. Int. In the Spotlight (Chinese arts and cultural magazine)

0530 R. Australia Fine Music Australia (Australian classical music performances)

0540 R. Habana Cuba DXers Unlimited (Amie Coro presents a program from radio enthusiasts)

**Monday-Friday**

0505 R. New Zealand Int. Checkpoint (RNZ National Radio's flagship evening news program)

0510 R. Australia Pacific Beat (one of RA's primary programs, this daily current events and features magazine focuses in on the Pacific island nations)

0515 R. Japan 44 Minutes (current affairs magazine about Japan and Asia)

**Monday**

0500 R. Habana Cuba Weekly Review (Cuba's perspective on current events)

R. Netherlands Dutch Horizons (Bertine Krol chronicles life in Holland)

WWCR(3210kHz) World of Radio (Glenn Houser's comprehensive review of the week in shortwave and international broadcasting)

0505 Deutsche Welle Religion and Society (an insight into religious events around the world)

0515 Deutsche Welle Cool (Erica Gingerich and Anke Rasper present DW's youth magazine with reports on the attitudes, music and style of young Europe)

0530 China R. Int. People in the Know (interviews with prominent Chinese who are shaping the nation's future)

R. Habana Cuba 40th Anniversary of RHC (special reports on the history of the station)

WWCR(3210kHz) Communications World (Kim Elliott reviews the week in global communications)

0540 R. Habana Cuba The Mailbag Show (listener letters)

0545 R. Exterior de Espana Radio Club (a repeat of Saturday's program)

0550 R. Habana Cuba Breakthrough (Amie Coro with a report on science)

**Tuesday-Saturday**

0500 R. Exterior de Espana REE's News Service (featuring international, Ibero-American and national news in-depth, a review of the Spanish press, commentaries and analyses)

0505 Deutsche Welle Newslink (daily current affairs magazine focused on Europe)

0545 R. Exterior de Espana Spanish Language Course

**Tuesday**

0500 R. Netherlands The Research File (a magazine emphasizing the relevance of science to all our lives)

0505 WWCR(3215kHz) The Golden Age of Radio Theatre (classic American radio programs)

0530 China R. Int. Sports World (the sports scene in China and Asia)

Deutsche Welle Insight (a look at major international trends and developments)

**Wednesday**

0500 HCB Ecuador The Book and the Spade (the latest discoveries and developments in Biblical archaeology)

R. Netherlands Music 52/15 (Martha Hawley presents musical styles from around the globe)

0505 WWCR(3215kHz) The Golden Age of Radio Theatre (classic American radio programs)

0530 Deutsche Welle Man and Environment (John Hay presents the human element in environmental issues)

0540 R. Habana Cuba DXers Unlimited (Amie Coro presents a program for radio enthusiasts.)



Radio Singapore International

# Shortwave Guide



**Thursday**  
 0500 R. Netherlands The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)  
 0505 WWCR(3215kHz) The Golden Age of Radio Theatre (classic American radio programs)  
 0530 Deutsche Welle Living in Germany (people, places and events in Germany)

**Friday**  
 0500 HCJB Ecuador Inspirational Classics (classical music selections inspired by religious and spiritual themes)  
 R. Netherlands Talking It Over (Chris Chambers interviews well-known people who are Dutch or who have live in Holland for many years)  
 0505 WWCR(3215kHz) The Golden Age of Radio Theatre (classic American radio programs)  
 0515 R. Netherlands From Sapphire to Laser (Rob Green's classical music series first broadcast in the mid-'90s)  
 0530 China R. Int. Life in China (a weekly magazine focusing on the lives of ordinary people in China)  
 Deutsche Welle Hard to Beat: The World of Sport (weekly report on German and European sport)  
 R. New Zealand Int. The Pacific Report (a report on trends and events in the Pacific region)

**Saturday**  
 0500 R. Netherlands A Good Life (how development affects societies)  
 WHRI Diving with Cumbre (Marie Lamb with the hottest DX catches)  
 0505 R. Australia Pacific Focus-Sport (the week's sports news as reported on the daily magazine "Pacific Beat")  
 R. New Zealand Int. The Best of Kim Hill (highlights from Kim's conversations from the past week)  
 0510 R. Japan Hello from Tokyo (listener letters, music and short features)  
 0530 Deutsche Welle German by Radio (a language lesson)  
 R. Australia Lingua Franca (a program about language and its social, cultural and historical ramifications)  
 0535 R. Exterior de Espana Radio Club (answering listeners' letters)  
 0545 R. Exterior de Espana Radio Waves (a weekly program for radio enthusiasts)

## 0600 UTC - Page 45 Freqs

**Sunday**  
 0600 WWCR(5070kHz) Keen on Jazz  
 0605 R. Australia The Europeans (historical and cultural perspectives on European societies)  
 R. New Zealand Int. Whenua! (Maori cultural magazine)  
 R. Japan Weekend Square (A program designed to present various aspects of Japan in a friendly and relaxed atmosphere with interviews, music and discussions.)  
 0630 WHRI(5745kHz) Diving with Cumbre (Marie Lamb with the latest DX catches)  
 WWCR(3215kHz) World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)  
 0635 R. Habana Cuba The World of Stamps (This just might be the only program on radio on philatelic matters.)  
 0645 R. Habana Cuba 40th Anniversary of RHC (special reports on the history of the station)

**Monday-Friday**  
 0606 R. New Zealand Int. What's Going On? (daily NZ entertainment and arts calendar)  
 0615 R. Japan Asian Top News (the day's major stories as reported by the region's radio stations)  
 0620 R. Australia Pacific Focus (daily regional report concentrating each weekday on a different theme—business, health, environment, sport and culture)  
 0645 R. New Zealand Int. Storytime (children's stories)

**Monday**  
 0600 WWCR(3210kHz) Spectrum (communications magazine)  
 WWCR(5070kHz) Ken's Country Classics (classic country music)  
 0610 R. Habana Cuba From Havana (a showcase of contemporary Cuban music and musicians)  
 0625 R. Japan Unforgettable Musical Masterpieces (a focus on Japanese pop songs written in the past war years as a means of explaining Japanese history and attitudes)  
 0630 R. Habana Cuba The Jazz Place (the very best of Cuban jazz)  
 R. New Zealand Int. Letter from America (the BBC's Alistair Cooke's weekly commentary)  
 0640 R. Australia The Australian Music Show (the latest rock music from the Triple J youth network of the ABC)

**Tuesday-Saturday**  
 0600 WWCR(3210kHz) World Wide Country Radio (country music)

**Tuesday**  
 0625 R. Japan Let's Learn Japanese (a Japanese language lesson for beginners)  
 0630 R. New Zealand Int. Today in Parliament  
 0640 R. Australia Music Deli (Australian performances of folk, acoustic, traditional and world music)

**Wednesday**  
 0625 R. Japan Japan Music Log  
 0630 R. New Zealand Int. Today in Parliament

0640 R. Australia Blacktracker (Mal Honess presents contemporary Aboriginal music.)  
**Thursday**  
 0625 R. Japan Brush Up Your Japanese (an intermediate course in Japanese)  
 0630 R. New Zealand Int. Today in Parliament  
 0640 R. Australia Oz Country Style (country music from Australia)

**Friday**  
 0605 R. New Zealand Int. Focus on Politics (a report on government and politics in NZ)  
 0625 R. Japan Music Beat (contemporary Japanese popular music)  
 0630 R. New Zealand Int. Pacific Report (RNZI correspondent Don Wiseman interviews and reports on regional matters)  
 0640 R. Australia Jazz Notes (Australian jazz presented by Ivan Lloyd)

**Saturday**  
 0610 R. Japan Pop! Goes Asia (a look at Asia as it is now, presenting the cultures and lifestyles of other Asian countries through their popular music)  
 0630 BBCWS(am) People and Politics (the week in Parliament)  
 R. Australia Oz Sounds (Australian new music releases)  
 R. New Zealand Int. In a Mellow Tone (Hayden Shirley plays relaxing and nostalgic music)

## 1000 UTC - Page 47 Freqs

**Daily**  
 1000 VOA News Now (the VOA's continuous rolling news service with analysis, sports, business reports and topical features)

**Sunday**  
 1005 R. Australia The Buzz (the week's big technology news and issues presented by Richard Aedy)  
 1010 R. New Zealand Int. Mediawatch (analyses of recent media events and trends in NZ)  
 1030 BBCWS(am) Agenda (ideas and trends shaping our world)  
 1033 VOA News Now On the Line (US foreign policy discussed and debated)  
 1035 R. Netherlands Wide Angle (a weekly in-depth look at a news topic)  
 1055 R. Netherlands The Week Ahead (on RN the next seven days)

**Monday-Friday**  
 1000 R. New Zealand Int. Late Edition (major domestic evening news magazine)  
 1010 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)  
 1030 BBCWS(am) World Business Report  
 R. Australia The Health Report (Dr. Norman Swan's weekly report on health and medical issues)  
 R. Netherlands Newslines (news, analysis and background reports)

**Tuesday**  
 1030 R. Australia The Law Report (Damien Carrick presents breaking legal stories in Australia and overseas)

**Wednesday**  
 1030 R. Australia The Religion Report (Lyn Gallacher examines the way religion and societies interact)

**Thursday**  
 1030 R. Australia The Media Report (Mick O'Regan takes a critical look at the latest developments in the communications industry)

**Friday**  
 1030 R. Australia The Sports Factor (Amanda Smith presents reports which debate and celebrate the cultural significance of sport)

**Saturday**  
 1000 WWCR(5070kHz) The Old Record Shop (vintage recordings)  
 1005 R. Australia Pacific Review (top reports from the past week's Asia Pacific magazine)  
 1010 R. New Zealand Int. Deep Purple (relaxing, thoughtful and nostalgic music)  
 1030 BBCWS(am) Science in Action (science and technology news presented by Richard Black)  
 R. Australia In Conversation (Robin Williams talks not only to scientists, but also to those interested in the subject, about what it's meant to their lives)  
 1033 VOA News Now Best of 'Talk to America' (excerpts from previous editions of this VOA listener phone-in)  
 1035 R. Netherlands Europe Unzipped (the events of the past week in Europe, some unusual)  
 1055 R. Netherlands Insight (Rob Green casts a critical and humorous eye on the past week's headlines)

## 1100 UTC - Page 48 Freqs

**Sunday**  
 1100 R. Netherlands Aural Tapestry (David Swatling weaves threads from different cultures and periods of history to tell interesting stories)  
 1105 R. Australia Correspondents Report (The ABC's overseas reporters give their interpretation and analysis of the week's major events)

R. New Zealand Int. Sportsworld (a weekly sports magazine produced by commercial NZ network Radio Sport)  
 1110 R. Japan Hello from Tokyo (listener letters, music and short features)  
 1130 R. Australia The Business Report (a weekly round-up of the latest business news and information from Australia and the world presented by Narelle Hooper)

BBCWS(am) Arts in Action (a weekly report on trends and developments in the fine arts around the world)  
 1130 R. Netherlands Dutch Horizons (Bertine Krol chronicles life in Holland)

R. Sweden In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström)  
 Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first.)  
 1140 R. Korea Int. Multiwave Feedback (RKI's interactive program for DXers and SWLs)

**Monday-Friday**  
 1105 BBCWS(am) Caribbean Report (the latest news in the Caribbean)  
 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)

1110 BBCWS(am) Caribbean Sport  
 1115 BBCWS(am) Caribbean Magazine (a current affairs and feature program focusing on life in the region)

R. Japan Asian Top News (the day's major stories as reported by the region's radio stations)  
 1130 BBCWS(am) World Business Report (a guide through the main business issues of the day)

HCJB Ecuador Morning in the Mountains (the longstanding breakfast program from The Voice of the Andes with news, sports, prayer, friendly conversation and inspirational music)  
 R. Australia RA Sport (a daily report on sports events in Australia, Asia and the world)

1130 R. Sweden Sixty Degrees North (reports, interviews and analysis on the Nordic region)

**Monday**  
 1100 R. Netherlands EuroQuest (a magazine placing Europe in context)  
 1105 R. New Zealand Int. Kim Hill (interviews on topical issues and events)  
 1125 R. Japan Unforgettable Musical Masterpieces (a focus on Japanese pop songs written in the past war years as a means of explaining Japanese history and attitudes)

1130 BBCWS(am) Letter from America (commentary on America by Alistair Cooke)

R. Netherlands The Research File (a magazine emphasizing the relevance of science to all our lives)

1145 BBCWS(am) Sports Round-up (all the daily sporting news worldwide)  
 R. Sweden Sports Scan (a weekly report on sports in the Nordic region)

**Tuesday**  
 1100 R. Netherlands A Good Life (how development affects societies)  
 WWCR(15685kHz) World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)

1105 R. New Zealand Int. Kim Hill (interviews on topical issues and events)  
 1125 R. Japan Let's Learn Japanese (a Japanese language lesson for beginners)

1130 BBCWS(am) Analysis (background to stories in the news)  
 R. Netherlands Music 52-15 (Martha Hawley presents musical styles from around the globe)

1145 R. Korea Int. Cultural Promenade (reports on contemporary and traditional Korean arts and culture)

1145 BBCWS(am) Sports Round-up (all the daily sporting news worldwide)  
 R. Sweden Close Up (profiles of people in Sweden from all walks of life)

**Wednesday**  
 1100 R. Netherlands Dutch Horizons (Bertine Krol chronicles life in Holland)

WWCR(15685kHz) Communications World (Kim Elliott reviews the week in global communications.)

1105 R. New Zealand Int. Kim Hill (interviews on topical issues and events)  
 1125 R. Japan Japan Music Log  
 1130 BBCWS(am) Analysis (background to stories in the news)

R. Netherlands The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)

1145 BBCWS(am) Sports Round-up (all the daily sporting news worldwide)  
 R. Korea Int. Economic Radar (reports on Korean businesses and the Korean and Asian economies)

1145 R. Sweden Money Matters (a weekly economic report on the Nordic region)

**Thursday**  
 1100 R. Netherlands The Research File (a magazine emphasizing the relevance of science to all our lives)

1105 R. New Zealand Int. Kim Hill (interviews on topical issues and events)  
 1125 R. Japan Brush Up Your Japanese (an intermediate course in Japanese)  
 1130 BBCWS(am) From Our Own Correspondent (background to the news from BBC correspondents around the world)

R. Netherlands Talking It Over (Chris Chambers interviews well-known people who are Dutch or who have live in Holland for many years)

1145 BBCWS(am) Sports Round-up (all the daily sporting news worldwide)  
 R. Korea Int. Korea and Its Splendors (a visit to a major historical, cultural or tourist attraction in Korea)



# Shortwave Guide



R. Netherlands	From Sapphire to Laser (Rob Green's classical music series first broadcast in the mid-'90s)
R. Sweden	Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month) Greenscan (Azariah Kiros highlights Swedish environmental awareness and challenges the second week of the month.) Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month.) The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month.)
<b>Friday</b>	
1100 R. Netherlands	The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)
1105 WWCW(15685kHz)	The Big Backyard (Australian country music)
1125 R. New Zealand Int.	Sports Story (a sport profile or documentary)
1130 R. Japan	Music Beat (contemporary Japanese popular music)
1130 BBCWS(am)	Analysis (background to stories in the news)
R. Netherlands	A Good Life (how development affects societies)
R. New Zealand Int.	RNZI Top Five (the best-selling music in NZ)
1145 R. Korea Int.	Notes of Nostalgia (traditional Korean music)
1145 BBCWS(am)	Football Extra (global soccer news, reviews and interviews)
R. Sweden	A Report on the Nordic Newsweek (the week's main news stories)
<b>Saturday</b>	
1100 R. Netherlands	Roughly Speaking (European youth lifestyles magazine)
1105 WWCW(5070kHz)	This Week in Americana (magazine about antique collecting)
R. Australia	Asia Pacific Weekend Edition (weekly current events and business report for and about Asia and the Pacific region)
R. New Zealand Int.	The World in Sport (Dimitri Edwards presents highlights of the world's sporting week with emphasis on NZ and the Pacific.)
1110 R. Japan	Pop! Goes Asia (a look at Asia as it is now, presenting the cultures and lifestyles of other Asian countries through their popular music)
1130 BBCWS(am)	World Business Review (Martin Webber explains the consequences of recent business developments for companies, investors and consumers)
R. Australia	Fine Music Australia (Australian classical artists with Charles Southwood)
R. Netherlands	Aural Tapestry (David Swatling weaves threads from different cultures and periods of history to tell interesting stories)
R. Sweden	Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month) Sweden Today (George Wood presents the voices of Sweden, the second week of the month) Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month) Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)
WHRI(9495 kHz.)	Dixing with Cumbre (Marie Lamb with the hottest DX catches)
1135 R. New Zealand Int.	Dateline Pacific (the major Pacific stories of the week, with background and reaction from the people making the news, presented by Don Wiseman)
1140 R. Korea Int.	From Us to You (RKI answers listener mail and rewards its contest winners)
1145 BBCWS(am)	Sports Round-up (all the daily sporting news worldwide)

## 1200 UTC - Page 48 Freqs

<b>Daily</b>	
1200 BBCWS(am)	Newshour (an hour of news and analysis from around the globe)
<b>Sunday</b>	
1205 R. Australia	Country Club (Richard Porteous with an off-the-road ramble through the various tracks that make up that very wide field of country music)
R. Netherlands	Sincerely Yours (Howard Shannon and Neville Powis host RN's listener response program)
1230 R. Sweden	In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström) Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first.)
1230 YLE R. Finland	Capital Cafe (conversations with Finns from all walks of life)
<b>Monday-Friday</b>	
1200 HCIB Ecuador	Latin American and International News
R. Netherlands	Newsline (news, analysis and background reports)
1205 BBCWS(am)	Caribbean Business (a report on regional commerce and economics)
HCIB Ecuador	Sports Report
1210 BBCWS(am)	Caribbean Report (the latest news in the Caribbean)
HCIB Ecuador	Morning in the Mountains (continues from 1130)
1210 R. Canada Int.	This Morning (Shelagh Rogers hosts a lively mix of interviews, documentaries, music, and personal essays debating and discussing issues important to Canadians and showcasing

Canada's finest writers, musicians, and artists.)	
Latin American and International News	
Sixty Degrees North (reports, interviews and analysis on the Nordic region)	
Finland This Morning (a breakfast program with news, a business report, sports, weather and interviews focused on Finland and the Nordic region)	
Morning in the Mountains (continues from 1130)	
<b>Monday</b>	
1205 R. Australia	Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)
1245 R. Sweden	Sports Scan (a weekly report on sports in the Nordic region)
<b>Tuesday</b>	
1205 R. Australia	Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)
1245 R. Sweden	Close Up (profiles of people in Sweden from all walks of life)
<b>Wednesday</b>	
1205 R. Australia	Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)
1245 R. Sweden	Money Matters (a weekly economic report on the Nordic region)
<b>Thursday</b>	
1205 R. Australia	Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)
1245 R. Sweden	Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month) Greenscan (Azariah Kiros highlights Swedish environmental awareness and challenges the second week of the month) Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month) The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)
<b>Friday</b>	
1205 R. Australia	Sound Quality (Tim Ritchie seeks out the interesting, the evolutionary, the inaccessible and the wonderful in music)
1245 R. Sweden	A Report on the Nordic Newsweek (the week's main news stories)
<b>Saturday</b>	
1200 WHRI(6040kHz.)	Dixing with Cumbre (Marie Lamb with the hottest DX catches)
1205 R. Australia	The Spirit of Things (Dr. Rachael Kohn explores contemporary values and beliefs as expressed through ritual, art, music, and sacred texts)
1230 R. Sweden	Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month) Sweden Today (George Wood presents the voices of Sweden, the second week of the month)

Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)	
Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)	
Dixing with Cumbre (Marie Lamb with the hottest DX catches)	
Finland This Week (the best reports and interviews from the weekday program, Finland This Morning)	
Starting Finnish (a language lesson)	

## 1300 UTC - Page 49 Freqs

<b>Sunday</b>	
1300 Channel Africa	Channel Africa Extra (a weekend magazine and variety show with news, sports, music, regular reports and features)
1305 BBCWS(am)	Jazzmatazz (weekly jazz magazine)
R. Australia	Country Club (continues from 1205)
1310 R. Canada Int.	The Sunday Edition (the more relaxed and reflective weekend edition of This Morning, hosted by Michael Enright)
1320 China R. Int.	In the Spotlight (Chinese arts and cultural magazine)
1330 BBCWS(am)	In Praise of God (diverse services of worship)
R. Sweden	In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström) Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first.)
<b>Monday-Friday</b>	
1300 R. Australia	RA News (a fifteen minute report with emphasis on significant events in Asia and the Pacific region)
1305 BBCWS(am)	Outlook (topical magazine of people, places and events)
1305 R. Canada Int.	This Morning (continues from 1210)
1315 R. Australia	The Planet (Lucky Oceans, a/k/a Reuben Gosfield, presents good, heartfelt, inspiring music from around the world with a rich mix of jazz, blues, folk styles, art music and more in a show artfully arranged for radio.)
1330 R. Sweden	Sixty Degrees North (reports, interviews and analysis on the Nordic region)
1345 BBCWS(am)	Off the Shelf (abridged serialized readings of novels, stories and other literature)
<b>Monday</b>	
1330 China R. Int.	People in the Know (interviews with prominent Chinese who are shaping the nation's future)
1345 R. Sweden	Sports Scan (a weekly report on sports in the Nordic region)
<b>Tuesday</b>	
1330 China R. Int.	Sports World (the sports scene in China and Asia)
1345 R. Sweden	Close Up (profiles of people in Sweden from all walks of life)
<b>Wednesday</b>	
1345 R. Sweden	Money Matters (a weekly economic report on the Nordic region)

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# Shortwave Guide



<b>Thursday</b>			1445 R. Canada Int.			Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)			1505 BBCWS(am)			Discovery (in-depth exploration of ideas and discoveries in science and technology)		
1345 R. Sweden									1530 BBCWS(am)			Essential Guide (the biggest developments, issues and names in global affairs)[This month: the last two programs in the series <i>Gene Pioneers</i> - Peter Evans in conversation with scientists leading the genetic revolution]		
									R. Australia			The Law Report (Damien Carrick presents breaking legal stories in Australia and overseas.)		
									R. Netherlands			A Good Life (how development affects societies)		
<b>Friday</b>									<b>Wednesday</b>					
1330 China R. Int.			Life in China (a weekly magazine focusing on the lives of ordinary people in China)						1500 R. Netherlands			The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)		
1345 R. Sweden			A Report on the Nordic Newsweek (the week's main news stories)						1505 BBCWS(am)			Health Matters (reports on research explaining where medicine is going)		
									1530 R. Australia			The Religion Report (Lyn Gallacher examines the way religion and societies interact)		
<b>Saturday</b>									1530 BBCWS(am)			Everywoman (the BBC's international magazine for women)		
1300 Channel Africa			Channel Africa Extra (a weekend magazine and variety show with news, sports, music, regular reports and features)						R. Netherlands			Dutch Horizons (Bertine Krol chronicles life in Holland)		
1305 BBCWS(am)			Global Business (Peter Day charts the transformations sweeping through the world of work and commerce)						<b>Thursday</b>					
R. Australia			The Science Show (one of the longest running programs on ABC Radio)						1500 R. Netherlands			Talking It Over (Chris Chambers interviews well-known people who are Dutch or who have lived in Holland for many years)		
1310 R. Canada Int.			The House (Jason Masovitz presents a review of the week in Canadian national politics)						1505 BBCWS(am)			Go Digital (technology journalist Tracey Logan explains the latest in IT)		
1330 BBCWS(am)			People and Politics (inside British politics)						1515 R. Netherlands			From Sapphire to Laser (Rob Green's classical music series first broadcast in the mid-'90s)		
R. Sweden			Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)						1530 BBCWS(am)			Focus on Faith (Trevor Barnes looks at the religious stories behind the news)		
			Sweden Today (George Wood presents the voices of Sweden, the second week of the month)						R. Australia			The Media Report (Mick O'Regan takes a critical look at the latest developments in the communications industry)		
			Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)						R. Netherlands			The Research File (a magazine emphasizing the relevance of science to all our lives)		
			Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)						<b>Friday</b>					
									1500 R. Netherlands			A Good Life (how development affects societies)		
									1505 BBCWS(am)			Sports International (the issues and personalities behind the headlines)		
									1530 BBCWS(am)			Pick of the World (Daire Brehan presents World Service highlights and talks with the producers and presenters of BBC programs)		
									China R. Int.			Life in China (a weekly magazine focusing on the lives of ordinary people in China)		
									R. Australia			The Sports Factor (Amanda Smith presents reports which debate and celebrate the cultural significance of sport.)		
									R. Netherlands			The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)		
									<b>Saturday</b>					
									1500 R. Netherlands			Aural Tapestry (David Swatling weaves threads from different cultures and periods of history to tell interesting stories)		
									1505 BBCWS(am)			Sportsworld (continues from 1405)		
									R. Australia			Melisma (Robyn Johnston weaves together chamber music, folk sources and jazz innovations in a graceful, melodic and sometimes challenging two hours)		
									R. Canada Int.			Quirks and Quarks (what's new and next in science)		
									1530 R. Netherlands			Roughly Speaking (European youth lifestyles magazine)		
									<b>Monday-Friday</b>					
									1505 R. Australia			Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)		
									<b>Monday</b>					
									1500 R. Netherlands			The Research File (a magazine emphasizing the relevance of science to all our lives)		
									1505 BBCWS(am)			One Planet (stories about the environment, development, agriculture and human impact on the natural world)[This month: the last three programs in the series <i>The Lie of the Land</i> - commercial, social and political pressures that influence land use]		
									1530 BBCWS(am)			People and Places (a forum for the exchange of views and experiences on a global scale)[This month: the last two interviews in the series <i>About Face</i> ]		
									R. Australia			The Health Report (Dr. Norman Swan's weekly report on health and medical issues)		
									R. Netherlands			EuroQuest (a magazine placing Europe in context)		
									<b>Tuesday</b>					
									1500 R. Netherlands			Music 52-15 (Martha Hawley presents musical styles from around the globe)		

# Shortwave Guide



## 2200 UTC - Page 54 Freqs

WWCR(15685kHz) World Wide Country Radio (country music)  
1630 BBCWS(am) World Business Report  
1645 BBCWS(am) Sports Roundup (all the daily sporting news worldwide)

### Tuesday

1605 R. Australia The Comfort Zone (Alan Saunders presents a unique program that debates and celebrates the cultural significance of architecture and design, landscape and gardens, and food)

### Wednesday

1605 R. Australia Verbatim (a program that charts the story of the 20th century through the voices of ordinary Australians)  
1630 R. Australia Earshot (a half-hour feature from the footpaths, paddocks, lounge rooms and shopping malls of the diverse Australian continent)

### Thursday

1605 R. Australia Hindsight (a documentary program that looks at Australian social history through the broad themes of institutions, popular culture, health and the environment)

### Friday

1605 R. Australia Away! (Produced and presented by Aboriginal broadcasters, this is Australia's only national indigenous arts and culture program)

### Saturday

1600 BBCWS(am) News  
1605 BBCWS(am) Sportsworld (continues from 1405)  
R. Australia Melisma (continues from 1505)  
R. Netherlands Europe Unzipped (the events of the past week in Europe, some unusual)  
1630 WWCR(12160kHz) Keen on Jazz

## 2100 UTC - Page 53 Freqs

### Sunday

2100 WBCQ(7415kHz) Communications World  
2105 BBCWS(am) Global Business (Peter Day charts the transformations sweeping through the world of work and commerce)

2110 R. Australia AM (ABC Radio's flagship morning news magazine)  
2130 R. Australia Educational series (a series of documentary programs dealing with Asian or Pacific history, politics or communications. Specific details were unavailable at deadline.)  
2145 BBCWS(am) Reporting Religion (the week's religion news)

### Monday-Friday

2100 WWCR(12160kHz) World Wide Country Radio (country music)  
2105 BBCWS(am) World Business Report

### Monday

2100 WBCQ(7415kHz) Jean Shepherd (the noted humorist's classic radio programs from the 60s and 70s)  
2110 R. Australia AM (ABC Radio's flagship morning news magazine)  
2130 R. Australia The Health Report (Dr. Norman Swan's weekly report on health and medical issues)  
2145 WBCQ(7415kHz) Seldom Heard Radio (eclectic musical selections)

### Tuesday

2110 R. Australia AM (ABC Radio's flagship morning news magazine)  
2130 R. Australia Innovations (a program showcasing Australian invention, enterprise and ingenuity)

### Wednesday

2100 WBCQ(7415kHz) Uncle Ed's Musical Memories  
2110 R. Australia AM (ABC Radio's flagship morning news magazine)  
2130 R. Australia The Religion Report (Lyn Gallacher examines the way religion and societies interact.)

### Thursday

2110 R. Australia AM (ABC Radio's flagship morning news magazine)  
2130 R. Australia Rural Reporter (ABC's rural reporters present news and stories from rural and regional Australia)

### Friday

2100 WHRA(17650kHz.) Doing with Cumbre (Marie Lamb with the hottest DX catches)  
2105 R. Australia Feedback (Roger Broadbent answers listener questions and provides regular updates about RA)  
2130 R. Australia Oz Sounds (Australian new music releases)  
2130 WBCQ(7415kHz) Pab Sungenis Project (stand-up comedy and sketches)

### Saturday

2100 WBCQ(7415kHz) HarvZower (a personal selection of contemporary music)  
2105 R. Australia Australia All Over (Ian McNamara—aka "Macca"—hosts this celebration of Australiana and traditional Australian customs and values)  
2130 WHRA(17650kHz) Doing with Cumbre (Marie Lamb with the hottest DX catches)  
2145 BBCWS(am) Letter from America (commentary on America by Alistair Cooke)  
R. Australia Asia Sunday (a weekly report on regional events and issues)

### Daily

2200 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)

### Sunday

2200 R. Canada Int. The World This Weekend (CBC weekend news magazine)  
2210 R. Australia AM (ABC Radio's flagship morning news magazine)  
2230 BBCWS (am) Agenda (ideas and trends shaping our world)  
R. Canada Int. The Inside Track (anthologies and documentaries about sports and those who compete in them)  
R. Vlaanderen Int. Radio World (Frans Vossen presents a weekly report about international radio)  
2240 R. Australia The Australian Music Show (the latest rock music from the Triple J youth network of the ABC)

### Monday-Friday

2200 R. Canada Int. The World at Six (the CBC's flagship evening newscast)  
2230 R. Canada Int. As It Happens (Barbara Budd and Mary Lou Finley interview newsmakers from the mundane to ordinary people eyewitnessing news in the making)

### M o n d a y

2210 R. Australia AM (ABC Radio's flagship morning news magazine)  
2240 R. Australia Music Deli (Australian performances of folk, acoustic, traditional and world music)

### Tuesday

2210 R. Australia AM (ABC Radio's flagship morning news magazine)  
Voice of Turkey Live from Turkey (weekly listener phone-in with Reshide Morali. E-mail her with full phone number at <anakyra@yahoo.com> before or during show and she will call back)  
2240 R. Australia Blacktracker (Mal Holness presents contemporary Aboriginal music)

### Wednesday

2210 R. Australia AM (ABC Radio's flagship morning news magazine)  
2240 R. Australia Oz Country Style (country music from Australia)

### Thursday

2210 R. Australia AM (ABC Radio's flagship morning news magazine)  
2240 R. Australia Jazz Notes (Australian jazz presented by Ivan Lloyd)

### Friday

2205 R. Australia Asia-Pacific Weekend Edition (regional news and business report)  
2230 WBCQ(7415kHz) Alan Sane ("the way pirate radio used to sound in the '80s")

### Saturday

2200 R. Canada Int. The World This Weekend (CBC weekend news magazine)  
WBCQ(7415kHz) Radio Timoran Worldwide  
2205 WWCR(12160kHz) Keen on Jazz  
Correspondents Report (The ABC's overseas reporters give their interpretation and analysis of the week's major events.)  
2230 BBCWS(am) From Our Own Correspondent (background to the news from BBC correspondents around the world)  
R. Australia The Business Report (a weekly round-up of the latest business news and information from Australia and the world presented by Narelle Hooper)  
R. Canada Int. Comedy feature  
R. Vlaanderen Int. Music from Flanders (a half-hour of Flemish music, musicians and musical performances)  
WHRI(9495kHz.) Doing with Cumbre (Marie Lamb with the hottest DX catches)

## 2300 UTC - Page 54 Freqs

### Sunday

2300 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)  
WBCQ(7415kHz.) Le Show (Harry Shearer with a tour-de-force variety show.)  
WBCQ(9330kHz.) Veterans Info Radio (a program for veterans by veterans)  
2305 R. Canada Int. Global Village (Jowi Taylor fields reports and music from global venues)  
2310 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)  
2320 China R. Int. In the Spotlight (Chinese arts and cultural magazine)  
2330 BBCWS(am) The Greenfield Collection (Edward Greenfield plays classical music requests and selections drawn from his own collection)

R. Australia Earthbeat (Alexandra DeBlas presents a program on environmental science)  
2330 WHRI(5745kHz.) Doing with Cumbre (Marie Lamb with the hottest DX catches)  
WWCR(3215kHz) Ken's Country Classics (classic country music)  
2335 R. Netherlands Sincerely Yours (Howard Shannon and Neville Powis host RN's listener response program)  
2355 R. Netherlands The Week Ahead (on RN the next seven days)

### Monday-Friday

2305 BBCWS(am)  
2305 R. Canada Int.  
2330 R. Netherlands

Outlook (topical magazine of people, places and events)  
As It Happens (continues from 2230)  
Newsline (news, analysis and background reports)

### Monday

2310 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)  
2330 China R. Int. People in the Know (interviews with prominent Chinese who are shaping the nation's future)  
R. Australia The Buzz (the week's big technology news and issues presented by Richard Aedy)  
2345 BBCWS(am) Patterns of Faith (a global exploration of religious values and human wisdom)

### Tuesday

2310 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)  
2330 China R. Int. Sports World (the sports scene in China and Asia)  
R. Australia Arts Talk (Julie Copeland presents the world of arts and cultural ideas)

### Wednesday

2310 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)  
2330 R. Australia Rural Reporter (ABC's rural reporters present news and stories from rural and regional Australia)  
2330 WBCQ(7415kHz.) World of Radio (Glenn Houser's comprehensive review of the week in shortwave and international broadcasting)  
2345 BBCWS(am) Heart and Soul (global religious and spiritual experiences) [This month: Why Do Writers Write? - Rosemary Hartill in a series of six conversations with international authors with different religious beliefs who offer insight into their creative processes]

### Thursday

2310 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)  
2330 R. Australia The Media Report (Mick O'Regan takes a critical look at the latest developments in the communications industry)  
2345 BBCWS(am) What's the Problem (a panel of experts offers advice to listeners who write in with their problems)

### Friday

2305 R. Australia Lingua Franca (a program about language and its social, cultural and historical ramifications.)  
2330 China R. Int. Life in China (a weekly magazine focusing on the lives of ordinary people in China)  
R. Australia The Sports Factor (Amanda Smith presents reports which debate and celebrate the cultural significance of sport.)  
2345 BBCWS(am) Drugs That Changed the World (12-part series that tells the story of twelve different drug milestones of pharmacology)

### Saturday

2301 BBCWS(am) Play of the Week (classic and contemporary drama for radio)  
2305 R. Australia Ockham's Razor (sharp commentaries on scientific issues)  
2305 R. Canada Int. Quirks and Quarks (what's new and next in science)  
2330 R. Australia Innovations (a program showcasing Australian invention, enterprise and ingenuity)  
2335 R. Netherlands Europe Unzipped (the events of the past week in Europe, some unusual)  
2335 R. Netherlands Insight (Rob Green casts a critical and humorous eye on the past week's headlines)

## Thank You ...

### Additional Contributors to This Month's Shortwave Guide:

Bob Fraser, Cohasset, MA; Hans Johnson, WY/Ulis Fleming, MD / Cumbre DX/ BBCM; BBC Michael Murray, UK; Bill Riker, Boston, MA; William Seamans, Pineville, LA; Harold Sellers, DX Ontario; Hard Core DX; Radio Sweden/Media Scan; Usenet Newsgroups; Worldwide DX Club.



# Satellite Service Guide



Robert Smathers

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www.grove-ent.com/mtssg.html

## All Frequencies MHz

### Panamsat Galaxy 10R C-Band

#### 123 degrees West longitude

1(V)	3720	Data Transmissions
2(H)	3740	Data Transmissions
3(V)	3760	Data Transmissions
4(H)	3780	Data Transmissions
5(V)	3800	Showtime/The Movie Channel (West) (digital)
6(H)	3820	Data Transmissions
7(V)	3840	TVN (digital)
8(H)	3860	Data Transmissions
9(V)	3880	TVN (digital)
10(H)	3900	(none)
11(V)	3920	Toon Disney/Soapnet (digital)
12(H)	3940	TVN (digital)
13(V)	3960	TVN (digital)
14(H)	3980	Showtime HDTV (digital)
15(V)	4000	Showtime - West (VC2 +)
16(H)	4020	TV Land (VC2 +)
17(V)	4040	Nickelodeon - West (VC2 +)
18(H)	4060	The Movie Channel - West (VC2 +)
19(V)	4080	MTV - West (VC2 +)
20(H)	4100	Data Transmissions
21(V)	4120	ESPN/ESPN2 (VC2 +)
22(H)	4140	ESPN/ESPN2/ESPNNews (digital)
23(V)	4160	A&E - West (VC2 +)
24(H)	4180	Outdoor Channel

### Panamsat Galaxy 10R Ku-Band

#### 123 degrees West longitude

1(V)	11720	Occasional video
2(H)	11740	Data Transmissions
3(V)	11760	Occasional video
4(H)	11780	Wal-Mart In-Store Radio (SCPC) / Data Transmissions
	<b>1012.75</b>	Wal-Mart In-store Network
	<b>1013.15</b>	Sam's Club In-store Network
	<b>1013.50</b>	Wal-Mart In-store Network
	<b>1013.95</b>	Wal-Mart In-store Network
	<b>1014.25</b>	Sam's Club In-store Network
	<b>1014.75</b>	Wal-Mart In-store Network
	<b>1015.05</b>	Wal-Mart In-store Network
5(V)	11800	Data Transmissions
6(H)	11820	Data Transmissions
7(V)	11840	Data Transmissions
8(H)	11860	Data Transmissions
9(V)	11880	Occasional video
10(H)	11900	Data Transmissions
11(V)	11920	Data Transmissions
12(H)	11940	Data Transmissions
13(V)	11960	Data Transmissions
14(H)	11980	Data Transmissions
15(V)	12000	Data Transmissions
16(H)	12020	Data Transmissions
17(V)	12040	Data Transmissions
18(H)	12060	Data Transmissions
19(V)	12080	Occasional video
20(H)	12100	Occasional video
21(V)	12120	Occasional video
22(H)	12140	Occasional video
23(V)	12160	Occasional video
24(H)	12180	Occasional video

See ad on page 59 for satellite equipment from Universal Electronics

### Panamsat Galaxy 5 C-Band

#### 125 degrees West longitude

1(H)	3720	Disney Channel - East (VC2 +)
2(V)	3740	Playboy Channel (VC2 +)
	<b>5.58, 5.76</b>	KLON-FM, Long Beach, CA - Jazz
	<b>6.80</b>	FCC mandated safe-harbor audio
	<b>8.30</b>	Cable Radio Network
3(H)	3760	Trinity Broadcasting Network (VC2 +)
	<b>5.58, 5.78</b>	Trinity Broadcasting Radio Network
	<b>8.00</b>	Trinity Broadcasting Radio - Spanish SAP
4(V)	3780	Sci-Fi Channel (VC2 +)
5(H)	3800	CNN (VC2 +)
	<b>6.30</b>	CNN Radio News
	<b>7.58</b>	CNN Radio News
6(V)	3820	Superstation TBS (VC2 +)
	<b>6.80</b>	World Radio Network 1
	<b>6.20</b>	World Radio Network 2
	<b>6.48</b>	Brother Stoire Radio
7(H)	3840	Superstation WGN (VC2 +)
	<b>6.80</b>	Yesterday USA
	<b>5.48</b>	Superguide Data Transmission
	<b>5.58, 6.12</b>	WCPE-FM, Raleigh/Durham/Chapel Hill, NC
	<b>6.30, 6.48</b>	WFM-FM, Chicago, IL - classical
8(V)	3860	HBO - West (VC2 +)
9(H)	3880	ESPN (VC2 +)
	<b>5.80</b>	ESPN Natural Sound
10(V)	3900	Infomercia TV
11(H)	3920	Fox Family Channel - East (VC2 +)
12(V)	3940	Discovery Channel - West (VC2 +)
13(H)	3960	CNBC - East (VC2 +)
14(V)	3980	ESPN2 (VC2 +)
15(H)	4000	HBO - East (VC2 +)
16(V)	4020	Cinemax - West (VC2 +)
17(H)	4040	TNT - East (VC2 +)
	<b>7.56</b>	La Cadena CNN Radio Noticias
18(V)	4060	TNN - The National Network - East (VC2 +)
19(H)	4080	USA Network - East (VC2 +)
20(V)	4100	BET - Black Entertainment TV (VC2 +)
21(H)	4120	Lifetime - West (VC2 +)
22(V)	4140	CNN Headline News (VC2 +)
	<b>6.30</b>	CNN Radio News
	<b>7.58</b>	CNN Headline News Radio
23(H)	4160	A&E - East (VC2 +)
24(V)	4180	Showtime - East (VC2 +)

### Panamsat Galaxy 9 C-Band

#### 127 degrees West longitude

1(V)	3720	(none)
2(H)	3740	Gospel Music Network (VC2 +)
	<b>5.40</b>	Truth Radio Network
	<b>5.80</b>	Truth Net
	<b>7.28</b>	Genesis Communications Radio Network
3(V)	3760	(none)
4(H)	3780	STARZ! - East (VC2 +)
5(V)	3800	The Church Channel (digital)
6(H)	3820	(none)
7(V)	3840	(none)
8(H)	3860	STARZ! - West (VC2 +)
9(V)	3880	(none)
10(H)	3900	(none)
11(V)	3920	(none)
12(H)	3940	STARZ! Theater - East (VC2 +)
13(V)	3960	(none)
14(H)	3980	(none)

15(V)	4000	(none)
16(H)	4020	Encore - East (VC2 +)
17(V)	4040	(none)
18(H)	4060	(none)
19(V)	4080	(none)
20(H)	4100	Encore Westerns - East (VC2 +)
21(V)	4120	(none)
22(H)	4140	(none)
23(V)	4160	(none)
24(H)	4180	(none)

### Loral Orion Telstar 7 C-band

#### 129 degrees West longitude

1(H)	3720	Worldlink TV (digital)
2(V)	3740	In Demand PPV (digital)
3(H)	3760	In Demand PPV (digital)
4(V)	3780	In Demand PPV (digital)
5(H)	3800	Playboy (digital)
6(V)	3820	Data Transmissions
7(H)	3840	PCTV - Television Por Cable (digital)
8(V)	3860	Data Transmissions
9(H)	3880	PCTV - Television Por Cable (digital)
10(V)	3900	Data Transmissions
11(H)	3920	PCTV - Television Por Cable (digital)
12(V)	3940	Athena TV (digital)
13(H)	3960	Occasional video
14(V)	3980	A&E Networks (digital)
15(H)	4000	Occasional video
16(V)	4020	Kingdom Vision Network
17(H)	4040	HBO HDTV (digital)
18(V)	4060	Athena TV (digital)
19(H)	4080	various Mexican cable services (digital)
20(V)	4100	Athena TV (digital)
21(H)	4120	Occasional video
22(V)	4140	Olympusat (digital)
23(H)	6385	Athena TV (digital)
24(V)	4180	Occasional video

### Loral Orion Telstar 7 Ku-band

#### 129 degrees West longitude

1(V)	11720	Occasional video
2(H)	11740	Starband (digital)
3(V)	11760	Data Transmissions
4(H)	11780	Starband (digital)
5(V)	11800	Occasional video
6(H)	11820	Occasional video
7(V)	11840	Starband (digital)
8(H)	11860	Data Transmissions
9(V)	11880	Occasional video
10(H)	11900	Starband (digital)
11(V)	11920	Data Transmissions
12(H)	11940	Starband (digital)
13(V)	11960	Occasional video
14(H)	11980	Starband (digital)
15(V)	12000	Data Transmissions
16(H)	12020	Occasional video
17(V)	12040	Occasional video
18(H)	12060	Occasional video
19(V)	12080	Data Transmissions
20(H)	12100	Starband (digital)
21(V)	12120	Data Transmissions
22(H)	12140	Occasional video
23(V)	12160	Data Transmissions
24(H)	12180	Starband (digital)

## Understanding Weather Satellites

**A**n e-mail from a reader prompted me to write a 'what's it all about' summary of weather satellite (WXSAT) activities for this edition. First, an update: by the time this is published, I should have managed to set up at least the APT system (explanation shortly!) in the new garden in Southampton, UK.

The first weather satellites (WXSATs) were launched by the USA in the early 1960s. Current WXSATs are in near-circular orbits above about 810 km altitude, and have a high orbital inclination (near, but not exactly 90°) that takes them over the poles on every orbit. Some are in orbits that are sun-synchronous – meaning that they pass over every location (for example Seattle, USA, or Paris, France) at about the same local (solar) time each day. This allows them to obtain and record images of everywhere on earth at least once every 24 hours – sometimes leading to the misnomer "spy satellites" by the lay media.

Although WXSAT orbits are carefully selected for each satellite, all are subject to the long-term effects of the Moon's gravitational pull, and comparable perturbations, so they gradually drift from their original tracks, unless carrying small boosters for regular re-adjustment.

Russian (Meteor and one Resurs) and American (NOAA) WXSATs provide one form of compatible telemetry – low resolution images called APT (automatic picture transmission) which are transmitted in real-time in the 137 MHz (VHF) band. In comparison with other telemetry, these signals are easy to receive and decode – hence their popularity in the WXSAT community.

Current American NOAA orbiters include NOAA-12, NOAA-14, NOAA-15 and NOAA-16, but the latter developed a fault preventing transmission of APT. They are operated by the

National Oceanographic and Atmospheric Administration (NOAA). The CIS (Commonwealth of Independent States) operates both Meteor and Resurs WXSATs, of which Meteor 3-5 (or alternatively Meteor 2-21) transmit APT in sunlight only – usually on 137.30 MHz.

Meteor orbits precess, that is they slowly change their planes with respect to the sun, and therefore their passage times change over all locations. The use of a satellite tracking program can show the daily and weekly sequence of pass time changes. Resurs 01-N4 is sun-synchronous, and transmits on 137.85 MHz.

### Transmission Formats

These constellations – NOAA and Meteor WXSATs – have different characteristics. NOAA WXSATs provide not only APT, but also a high resolution image transmission format (HRPT) in the 1700 MHz band, and in recent years, manufacturers have made use of high capability microprocessors to develop lower-cost tracking and decoding systems. This has brought access to HRPT imagery into the amateur market, even if only at the top end! Meteor satellites do not have a directly comparable facility; the Russians use other satellites for obtaining such imagery, though they also use NOAA HRPT data.

APT has been a standard signal transmission format since the 1960s, consisting of the main r.f. carrier, usually (but not always) right-circularly polarized in the 137 MHz band, to which a WXSAT receiver, fed by a crossed-dipole antenna, can be tuned. The scene below the satellite is scanned in real-time and the image analyzed to produce a signal amplitude dependent on the brightness at sequential points along the scan line. This information is amplitude modulated on to a 2.4 kHz sub-carrier, and the resulting variable signal then frequency modulated on to the main r.f. carrier. A purpose-designed WXSAT receiver reverses this process to generate an image scan line on the display monitor.

A subtle difference between NOAA and Meteor WXSATs is that, whereas Meteor WXSATs provide a single image per scan line, the NOAAs incorporate two – a visible channel adjacent to an infrared channel. This means that overnight passes of NOAAs provide continuous cloud coverage monitoring.

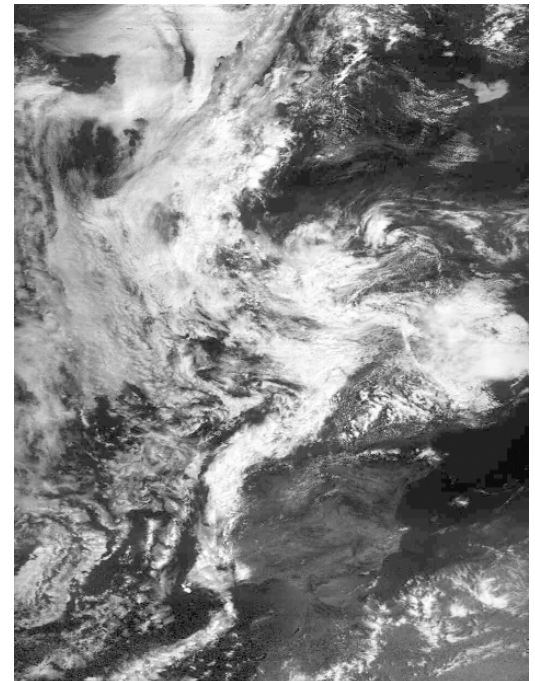
More sun-synchronous satellites are

planned for the future by both USA and Europe. A joint polar WXSAT venture will see Europe providing the morning satellite and the USA providing the afternoon satellite.

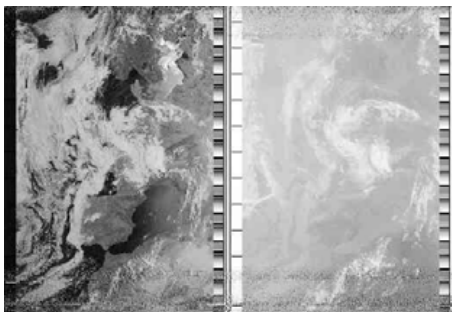
The other constellation of WXSATs is for geostationary orbits; here, satellites remain over the same location where they monitor the local hemisphere 24 hours per day. America operates GOES (Geostationary Operational Environmental Satellites), currently GOES-8 and 10, positioned over the east and west coasts respectively.

METEOSAT-5 and -7 are operated by EUMETSAT (European Organisation for the Exploitation of Meteorological Satellites). METEOSAT-5 operates from over India, and METEOSAT-7 is positioned above Greenwich, UK. GMS-5 is operated by Japan, and GOMS (Geostationary Operational Meteorological Satellite) was operated by the CIS (formerly Russia), until its failure. Some of these WXSATs use S-Band (1691.0 MHz) for low resolution images – called WEFAX (weather facsimile).

If you have set up a system that decodes APT, you can also decode WEFAX by adding a little more hardware and software, because the latter format is compatible.



**Resurs 01-N4 1125UTC 7 July**  
*The single-channel sensitivity is optimized for cloud and snow, rather than land.*



**NOAA-15 0752UTC 7 July 2001**  
*NOAA WXSATs transmit two images side-by-side - visible-light and infrared. During the night the visible channel reverts to an infrared one.*

# US Coast Guard VHF/UHF Frequencies (Part 2)

In the July issue of *MT's Fed Files* column we started a profile of U.S. Coast Guard VHF/UHF frequencies. This month we will conclude that profile with our exclusive listings of selected base frequencies. Transmission mode for this list is narrowband FM (NFM) unless otherwise indicated. Repeater frequency pairs are displayed (output frequency/input frequency) and all frequencies are in MHz (megahertz).

Both columns are dedicated to a special Coast Guard person in New Orleans.

### Coast Guard 1<sup>st</sup> District

Aids to Navigation Radio Control (ANRAC): 164.300 164.700  
165.3125 165.3375 169.600 171.2375 171.3125  
171.3625 406.575 407.625 409.000 410.025 415.625  
415.775 415.825 416.575 419.800

### Coast Guard Academy/Station New London, CT

Air-to-Ground: 381.7 381.8 383.9 (AM mode)  
Gun Control: 171.3125  
Law Enforcement net: 162.125 165.2625 171.3625  
Local Liaison net: 27.575 (AM mode)  
Medical net: 171.3375  
Public Works net: 171.2375

### Station Southwest Harbor, Maine

Customs net: 165.2375/166.4375  
Law Enforcement 162.325 165.2625  
NavAids Control: 415.825  
Radio Comm net: 171.3625/165.3375 419.800/409.000

### Air Station Cape Cod, Massachusetts

Air-to-Ground: 381.7 381.8 383.9 (AM mode)  
Emergency vehicle nets: 165.1375 (DoD Police net) 173.5875 (FAA Field Crash Net)  
Fire/Crash Net: 173.5875  
Maintenance net: 164.550 166.225 171.3625  
Medical/Security net: 171.3375  
Public Works net: 419.125

Vessel Traffic Service New York, New York: 406.5625 416.7125

### Coast Guard 5<sup>th</sup> District

Aids to Navigation Radio Control (ANRAC): 407.625 415.625 415.825  
Annapolis, Maryland Bay Bridge Remote Control: 406.5625 416.6375  
Backbone System (Maryland-New Jersey): 416.6375 406.5625  
Backbone System (Virginia-Maryland): 407.975 406.975 413.0375 419.6375  
Backbone System (North Carolina): 406.800 409.000 416.550 417.00  
Coast Guard Auxiliary, District wide: 143.280/148.725  
Coast Guard Reserve Emergency net (Washington, DC): 416.475/407.125 418.0125/409.2375  
Delaware Bridge Remote Control: 173.3375 409.000 419.125

Naval Communication Station Portsmouth, Virginia  
Naval Security Group Northwest Security net (Repeater/simplex):  
143.650/149.075  
Radio communications net: 171.3375/165.3375

Norfolk, Virginia, 5<sup>th</sup> District Intelligence Training net: 139.075 139.250 139.900

### Station Cape May, New Jersey

Air-to-Ground: 381.7 381.8 383.9 (AM mode)  
Fire: 171.3625  
Law Enforcement: 162.350 162.6125 163.025 165.2625 165.3125 171.2375  
Maintenance: 164.9125

### Station Governors Island, New York

Fire/Medical: 407.925 407.975  
Law Enforcement: 409.000 419.975  
Law Enforcement/Medical: 407.625  
Liaison net: 40.390  
Local Liaison net: 27.575 (AM mode)  
Maintenance net: 164.825/165.4125  
Paging/Maintenance: 165.2625  
Remote Ferry Bridge Control: 416.850 (Data)

### Station/Air Station Atlantic City, New Jersey

Air-to-Ground: 381.7 381.8 383.9 (AM mode)  
Law Enforcement: 165.2625

### Coast Guard 7<sup>th</sup> District

Air Station Borinquen, Puerto Rico  
Crash/Fire Vehicle Net: 122.8 (AM mode)

### Air Station Savannah, Georgia

Air-to-Ground: 381.7 381.8 383.9 (AM mode)  
Air-to-Ground Maintenance: 171.2375

### Cudjoe Key Coast Guard Detachment, Florida

Law Enforcement Operations: 165.2375 166.4375 166.4625

### Greater Antilles Cutters

ATC Station San Juan (SAR comms): 148.150 (CAP SAR) 257.8 (AM mode)  
ATC Station St. Thomas (SAR comms): 257.6 (AM mode)

### Great Antilles Section, San Juan, Puerto Rico

Housing Security net: 165.2625  
Law Enforcement: 162.125/163.050 162.325  
USN/USCG Cutter Liaison (Navy Ops Areas): 285.0 322.0 342.2 345.0 (AM mode)  
USN/USCG Hurricane Warning net: 138.575/143.675

### Station Charleston, South Carolina

Law Enforcement: 162.125/163.050 162.325  
Navy Command and Control/Emergency net: 149.350

### Station Jupiter, Florida

Auxiliary: 143.175/148.725 143.280/148.300

### Station Key West, Florida

Law Enforcement: 162.125/163.050 162.325  
USN/USCG Hurricane Warning net: 139.500

### Station/Air Station Clearwater/St. Petersburg, Florida

Air-to-Ground: 381.7 381.8 383.9 (AM mode)  
Crash/Fire Vehicle Net: 121.9 (AM mode)  
Fleet Tactical/Warning: 277.8 (AM mode)  
Law Enforcement: 162.125/163.050 162.325  
Search and Rescue: 282.8 (AM mode)

### Station/Air Station Miami, Florida

Air-to-Ground: 381.7 381.8 383.9 (AM mode)  
Communications Center: 165/2625 171.2375  
Crash/Fire Vehicle net: 121.9 (AM mode)  
Joint Operations: 353.900 (AM mode)  
Law Enforcement: 172.300/171.3125 171.3375  
Paging/Alert Net: 419.975  
Radio Comm net: 165.2625/171.2375  
Search and Rescue: 282.800 (AM mode)

### Coast Guard 8<sup>th</sup> District

Aids to Navigation Radio Control (ANRAC): 407.625

### Station Galveston, Texas

Air-to-Ground: 381.7 381.8 383.9 (AM mode)  
Law Enforcement net: 163.375 171.3625  
Vessel Traffic System net: 406.975/416.475

### Station/Air Corpus Christi, Texas

Air-to-Ground: 381.7 381.8 383.9 (AM mode)  
Law Enforcement net: 162.6125

### Station/Air Station Houston, Texas

Air-to-Ground: 381.7 381.8 383.9 (AM mode)

### Station/Air Station Mobile, Alabama

Air-to-Ground: 381.7 381.8 383.9 (AM mode)  
Engineering net: 164.175  
Fire: 164.300 164.9875  
Maintenance: 164.175 171.3375  
Search and Rescue: 282.8 (AM mode)  
Transportation: 171.3625

### Station/Air Station New Orleans, Louisiana

Air-to-Ground: 381.7 381.8 383.9 (AM mode)  
Auxiliary air frequencies: 122.9 122.95 123.100 (AM mode)  
Auxiliary land mobile frequencies: 171.3625/143.280 (Port Sulphur) 171.3125/143.280 (LaCombe) 171.2625/143.280 (Baton Rouge)

Note: these repeaters carry a variety of traffic from VHF marine channel 16 to SAR and law enforcement communications. Best listening in the area.



Auxiliary Air Station/SAR net: 171.2375 (Receives 143.280/157.175)  
 Backbone net: 419.975 (link to 415.775) 407.675 (link to 415.625)  
 415.925 (link to 419.125)  
 Communications Center: 165.2625 171.3375  
 Contingency net: 171.3375/165.2625  
 Law Enforcement: 162.325/163.375 163.050 165.3375  
 171.3625  
 Search and Rescue (SAR): 282.8

### Coast Guard 9<sup>th</sup> District

Aids to Navigation Radio Control (ANRAC): 165.3375 171.3625  
 407.625 407.975 409.000 415.625 415.775 415.825  
 Customs Service Liaison: 165.2375/166.4375  
 District Wide Area Land Mobile System: 164.125 164.5/165.445  
 166.075/165.3375 166.075/165.3375 166.150/  
 164.775 163.4375/164.765  
 Immigration Service Liaison: 162.925 163.325

### Air Station Traverse City, Michigan

Air-to-Ground: 381.7 381.8 383.9 (AM mode)  
 Fire/Crash Trucks: 320.5 (AM mode)

### Coast Guard 11<sup>th</sup> District

Aids to Navigation Radio Control (ANRAC): 165.3125 171.3125  
 171.34125 407.625 415.625 415.825  
 Customs Service Liaison Net: 165.2375/166.4375  
 Los Angeles Federal Executive Board Emergency Radio Network: 169.250  
 170.200  
 Region Emergency Transportation Coordinator net: 171.2375/162.225

### Air Station Sacramento, California

Aircraft/vehicle ground control: 169.250  
 Ground Control net: 150.275

### Air Station San Diego, California

Ground Control: 257.8 (AM mode)

### Station San Francisco, California

Communication Center Emergency net: 165.3375  
 Communications net: 345.5 364.6 372.6 380.475 388.2 388.5  
 398.2 398.4 (Wideband net)

### Coast Guard 13<sup>th</sup> District

Aids to Navigation Radio Control (ANRAC): 407.625 415.825

### Northbend, Oregon

Multi-Net: 406.800 409.200 416.600 418.450  
 Telephone Multiplex Net: 406.450 406.800 416.600 418.450

### Station Astoria, Oregon

Customs Service Liaison: 165.2375/166.4375  
 Wideband Multi-net: 406.800 409.200 416.600 418.450

### Coast Guard 14<sup>th</sup> District

Kia'i Kai Housing Units: 149.400 (data)

### Coast Guard 17<sup>th</sup> District

Aids to Navigation Radio Control (ANRAC): 165.3125 407.625  
 District Multiplex nets: 406.800 409.350 416.600 418.350  
 District Remote Control nets: 162.125 162.225 164.300 166.000  
 167.900 171.2375 171.3125 171.3625 407.625  
 415.625

### Station/Air Station Kodiak, Alaska

Crash/rescue vehicles: 121.9 (AM mode)  
 Fire/Alarm net: 171.3375  
 Mobile Telephone: 415.775/419.800

### Station/Air Station Sitka, Alaska

FAA Tower: 123.6 (AM mode)

## Base Security/Utility Nets

The Coast Guard has set aside quite a few VHF/UHF frequencies for use at their shore installations. If your base wasn't mentioned above, plug in the following universal frequencies into your scanner and listen for potential activity in your area.

VHF: 162.125 162.325 164.300 164.550 164.9875  
 164.9125 165.2125 165.2625 165.3125 165.3375  
 167.900 171.2375 171.3125 171.3375 171.3625  
 UHF: 407.625 407.925 407.975 409.825 415.775  
 415.925 416.850 417.000 419.125 419.650 419.800  
 419.850 419.975

## Coast Guard Reserve

Finally, several frequencies in the VHF low band have been set aside for Coast Guard Reserve units to practice communications. Check out the following frequencies on weekends for activity: 30.330 30.410 34.010 41.210 41.230 41.710 41.750 41.830

## Reader Reports – Coast Guard Activity

MT reader LT. Alan Yelvington passes along the following HF frequencies for the U.S. Coast Guard:

2103.5 kHz	Intra-Coast Guard
2182 kHz	International HF calling and distress frequency (HF equivalent to VHF Channel 16 156.8 MHz)
2670 kHz	Coast Guard Public liaison frequency (HF equivalent to VHF Channel 22 157.1 MHz)
2738.0 kHz	Coast Guard intership liaison
3023.0 kHz	SAR (on-scene)
5422.5 kHz	Coast Guard AuxNet 1
5680.0 kHz	SAR control frequency
5694.0 kHz	Air/Surface (small air station)s
5696.0 kHz	Air/Surface (large air station)s
7528.6 kHz	Coast Guard AuxNet 3
8984.0 kHz	Air/Surface primary

Keith Wyatt recently reported this list of USCG Land Mobile Repeaters on the SCAN-L newsgroup. This repeater system is used for administration, Oil Spill Clean Ups and disasters in the northwest United States.

Chnl	Frequency	Location
LM2	165.3125 TX 168.5000 RX	Adams Hill, Grays Harbor, Naselle Ridge, Tillamook Bay, Winchester Hill, Cape Blanco, Yaquina Bay, Goodwin Peak, Rocky Prairie, Siuslaw River, Seven Devils
LM3	163.5125 TX 171.1500 RX	Ft Lawton, Bahokus Peak
LM4	164.9125 TX 171.1500 RX	Browns Point S. Sound
LM5	164.8700 TX 171.1500 RX	MT Constitution & Striped Peak N. Sound
LM6	165.3125 TX 171.1500 RX	Miller Peak, Quillayute River
LM7	164.3000 TX 168.5000 RX	Oregon State Coastal Areas, used with Portable Repeater
LM8	165.0375 TX 168.5000 RX	Washington State Coastal Areas, used with Portable Repeater

Kenny Newell in Rockland, Massachusetts, reports the following Coast Guard activity from the Boston area during OpSail 2000.

162.0500	LANT 2 Input
163.1750	LANT 2 Repeater
162.1250	LANT 3 Primary channel in Boston Harbor
162.2250	LANT 4
162.2500	LANT 5
162.3250	LANT 6
163.0500	?
163.3750	LANT 11
164.0250	F-1
164.0750	F-2
164.3000	LANT 12
164.4250	?
164.9125	?

This lineup is still in use today, a year after the event, although the LANT 3 channel is pretty much the only LANT channel in use in Boston Harbor. Most communications are in the clear with little scrambling in use.

Bill Jasset in Eastern Massachusetts posted this VHF/UHF list on the internet forwarded to us by Ken Windyka.

157.050	Ch 21 Woods Hole-Canal-Ptown-Brant Pt
157.075	Ch 81 Group Boston-Pt Allerton-Gloucester-Merrimack River
157.100	Ch 22 NOTAMS-Working Channel
157.125	Ch 82 Cutter Operations
157.150	Ch 23 Portsmouth NH-Portland ME-Booth Bay ME
157.175	Ch 83 Coast Guard Auxiliary-Southwest Harbor-New Haven CT
159.480	LANT 28
162.125	LANT 30
162.250	LANT 31
162.325	LANT 35
163.050	LANT 33
163.175	LANT 32
163.4125	LANT 37
163.5375	LANT 38
164.300	Coast Guard (Group Boston Security)
164.550	Cape Air (Otis)
164.775	LANT 41
164.9125	Discrete Operations
165.1375	LANT 42
165.2375	LANT 47
165.2625	LANT 44
165.3375	Discrete Operations
165.4625	LANT 45
166.225	Bandit Control (Otis)
166.4375	LANT 48
166.4625	LANT 49
166.5875	LANT 50
167.9000	LANT 52
171.3375	LANT 55
173.5875	LANT 56
237.900	Search and Rescue (SAR) Training
259.000	Search and Rescue (SAR)
282.800	Search and Rescue (SAR)
381.000	Search and Rescue (SAR) Air Force
381.700	Cape Air (secondary)
381.800	Cape Air (primary)
383.900	Cutter/Helo Air-Water Hoist Training

## To Buy or To Wait? That's the Question

**A**s public safety agencies continue to field new digital trunked radio systems, many listeners question whether to purchase a new scanner soon or wait until a digital-capable unit becomes available.

*I'll try to be succinct. I am in a quandary about making a communications receiver purchase, and I really need the advice of someone who has a broader and more knowledgeable view than I do about what might transpire over the next three years or so regarding 30+MHz communications.*

*I bought a Radio Shack Pro-91 scanner – my first – for the bargain price of \$170 back in 1999. It does a good job (it's easy pickings in the Phoenix metro area where I live), but I know I'm missing a lot that's out there; besides, I would love to have a handheld unit capable of pulling in everything: AM broadcast, FM, shortwave, air, etc. But these units (I have my eye on the new Alinco) cost a considerable amount of money. My worry is this: that the whole scanning arena is going to be put upside down by the advent of digital. For example, there is already talk of the Phoenix police department going digital. I would hate to spend a lot of money on a radio whose capabilities would be greatly diminished in a couple of years.*

*What do you think? Buy now or wait for digital? I heard that Uniden or Motorola or somebody is already working on just such a scanner.*

*- Paul in Scottsdale, Arizona*

Well, Paul, my crystal ball is no better than anyone else's, but I'll give you some background information that might help in your decision. There are several different types of digital voice systems in use now in the United States, so let me summarize them in order of importance.

### Project 25

The Association of Public Safety Communications Officials International (APCO) Project 25 is by far the most popular digital system being fielded in the United States today. Previous *Tracking the Trunks* columns have detailed the specifics of Project 25 as they relate to scanner listeners.

Since most cities are upgrading older radio systems, the vast majority of Project 25

systems coming on-line use the old-style Motorola control channel rather than the fast channel described in the Project 25 standards. What this means is that current scanners that can trunk-track are able to follow Project 25 systems, although they can't decode the audio.

Project 25 uses a voice encoder called IMBE, or Improved Multi-Band Excitation. IMBE is patented by Digital Voice Systems, Inc. (DVS) and requires a license agreement in order to legally use it.

### OpenSky

A completely different system is being installed in the State of Pennsylvania, called OpenSky. This system uses the popular Internet Protocol (IP) and is rather unique in that all radio traffic is digital from one end of the system to the other. OpenSky uses a different DVS vocoder known as AMBE (Advanced Multi-Band Excitation), and as you might expect it is not compatible with Project 25.

On the positive side, Pennsylvania has indicated the possibility of making available pre-programmed OpenSky scanners, although there's no firm information on availability or pricing.

Tyco International, the same company that purchased Com-Net/Ericsson in April, owns OpenSky. With both systems under one roof it will be interesting to see how many Ericsson systems eventually migrate to OpenSky. Already Tyco has announced that OpenSky would be installed in a number of cities in Palm Beach County, Florida, for public safety use.

### ProVoice

The IMBE vocoder is also used in Ericsson's ProVoice, but ProVoice is not compatible with Project 25, so a Project 25 scanner will not automatically be able to follow ProVoice systems.

### VSELP

Older Motorola ASTRO systems may use a different vocoder referred to as VSELP, which stands for Vector Sum Excited Linear Prediction. As with any non-IMBE vocoder, VSELP is not compatible with Project 25, so again a Project 25 scanner would not be able to decode the audio on an ASTRO VSELP system.

### AEGIS

Ericsson has an old product called AEGIS that uses yet another type of vocoder, and of course it's not compatible with Project 25.

### ◆ Digital Decoders

Regarding the rumors you've heard, there are at least two different Project 25 scanner products that have been announced.

In April, Uniden's product planning manager revealed that they were working on a scanner that can monitor Project 25 voice transmissions, and they expect to be manufacturing it in a year or so.

A year ago in Boston at the annual APCO convention, ScannerMaster demonstrated a digital decoder board connected to a Bearcat 780XLT. Although Rich Barnett denies the decoder board was monitoring ASTRO communications, there is expectation in the scanner community that such a board will be available soon that will "drop in" to a 780XLT and allow Project 25 transmissions to be heard. At the Dayton Hamfest in May, ScannerMaster was advertising a drop-in board to be available in 2001.

Given these two efforts, there is a good chance that by this time next year a Project 25 scanner will be available to the general public. Even though new product development always takes longer than expected, I'd still save some money and wait a few months to see what actually becomes available.

I am not aware of any independent, public efforts to decode the other digital systems, so I would not expect widespread monitoring of OpenSky, ProVoice, VSELP or AEGIS. However, I'd love to hear from anyone working on decoding these systems!

### ◆ Selecting a Scanner

Digital considerations aside, choosing a scanner is a very subjective decision and a scanner that's right for one person may be completely wrong for another.

Do you have a long commute, or spend a lot of time in your car? Perhaps an installed mobile unit is the way to go. There are no batteries to check and it's always available. Be careful in Michigan, though, since you'll need a permit and a permanent installation is easy to see. Some other states and localities also have restrictions on scanner use in a vehicle. Check the <http://www.grove-ent.com/Llaws.html> website for your state's regulations.

If you're like me, portability is important. A small, easy-to-carry package brings the scanner along wherever you go. A handheld scanner in a backpack or fanny pack with a small earpiece is a low-visibility way to monitor, despite the Secret Service-type look. If you'd rather fit in with a different crowd, use a Walkman-type pair of headphones with a stereo-to-mono mini-plug so observers will assume you have a CD player rather than a scanner.

Some scanners have the ability, or can be modified, to accept commands from an external frequency counter like the OptoElectronics Scout. This feature is referred to as "reaction tune" and is very handy when you're near a tower or other transmitter but you're not sure what frequency it is using.

Since this is a column about trunked radio I won't go on about the myriad of non-trunking features that might influence your decision, but some other areas to consider include instant weather information, priority scan channels, and the ability to interface the scanner to a personal computer or personal digital assistant (PDA).



Instead, I've included a table of existing trunking scanners below, along with their date of introduction, any systems they can track in addition to Motorola Type I and II, and the number of channels the scanner memory can hold.

### ◆ TrunkTracking scanners

Uniden and Radio Shack are the two main suppliers of scanners that can track trunked radio systems. Each model listed, at a minimum, can track Motorola Type I and Type II systems.

#### Handhelds

Bearcat BC235XLT	1997		300
Bearcat BC245XLT	1999	EDACS	300
Radio Shack PRO-90	1997		300
Radio Shack PRO-91	1998		150
Radio Shack PRO-92	1999	EDACS, LTR	500
Radio Shack PRO-94	1999	EDACS	1000

#### Mobile

PRO-2066	1998		150
PRO-2067	2000	EDACS, LTR	500

#### Base/Mobile

Bearcat BC780XLT	2000	EDACS, LTR	500
Bearcat BC895XLT	1997		300
Radio Shack PRO-2050	1997		300
Radio Shack PRO-2052	1999	EDACS	1000

### ◆ Phoenix, Arizona

The last update I received indicated that the Phoenix police department is still using analog on conventional frequencies in the 150 and 450 MHz bands, and have not yet gone digital. There is a five-channel digital trunked test system operating from the Thompson Peak site in the McDowell Mountains north of Mesa, but I don't have any confirmed frequencies or talkgroups. This site is slated to eventually provide support for Phoenix and Mesa air operations in the East Valley.

Can any readers provide an update on the Phoenix digital system?

### ◆ Sawyer County, Wisconsin

*I am a reader of your Monitoring Times column on Tracking the Trunks. I was wondering if you could publish frequency lists and talkgroups and system types for my local area. I live in Sawyer County, Wisconsin, and information any trunked radio systems that are close by would be welcomed.*

- Gary

I checked the Federal Communications Commission (FCC) database at <http://gulfoss2.fcc.gov/cgi-bin/ws.exe/genmen/index.htm> for trunked radio systems operating in Sawyer County, Wisconsin. There are several frequencies assigned to Nextel; however, you will not be able to hear any voice traffic on these frequencies since the transmissions are in digital format.

The only other entry for trunked radio was a license holder listed as "Air Communications of Wisconsin" with the following frequencies: 451.9875, 452.2125, 452.3875, 452.7375 and 453.0125 MHz. The FCC database also indicates that the tower for these frequencies is located near the corner of Highway B and Tower Road. I'd be interested in learning what you or other readers might find out about this system.

### ◆ Arkansas State Police

*The Arkansas State Police is using the following voice frequencies: 856.3125, 856.4125, 856.4625, 856.7625, 856.8125, 856.8875, 856.9375, 856.9875, 857.3125, 857.4125, 857.4625, 857.7625, 857.8125, 857.8875, 857.9375, 857.9875, 858.3125, 858.4125, 858.4625, 858.7625, 858.8125, 858.8875, 858.9375, 858.9875, 859.3125, 859.4125, 859.4625, 859.7625, 859.8125, 859.8875, 859.9375 and 859.9875 MHz.*

*Data channels are usually found on 860.3125, 860.4125, 860.4625, 860.7625, 860.8125, 860.8875, 860.9375 and 860.9875 MHz.*

*The 32 voice channels listed are re-used throughout the state. The state is split in 12 troops. The number of repeaters in each troop*

*depends on its size. Some troops only have three repeaters, some have all eight, and most troops only have four or five repeaters in the troop. Each repeater is able to carry four different conversations at the same time, thanks to the four voice channels. Motorola Type I signaling is being switched over to type II signaling. I don't know how that change will affect the fleet maps.*

- Don

Can anyone confirm that the Arkansas Highway Police is still using 150.995 MHz?

### ◆ PRO 91 Update

Apparently there are now two versions of the Radio Shack PRO-91 trunked scanner. The new model, number 20-521A, has added a "Disconnect Tone Detect" feature, which will cause the scanner to automatically return to the data channel when a disconnect tone is received. Motorola trunked systems generate a sub-audible disconnect tone when a transmission is complete, but interference may cause the scanner to either miss the disconnect tone or to falsely believe that a disconnect tone has been sent.

From the updated manual:

**Disconnect Tone Detect** - The scanner automatically tunes to the trunking data channel when it receives a disconnect transmission. You can turn this off, to let you continuously monitor a channel with a weak transmission where conversations are often disconnected.

Most other trunk tracking scanners have this feature as well.

That's all for this month. More information is available on my website at <http://www.signalharbor.com>, and I welcome your electronic mail sent to [dan@signalharbor.com](mailto:dan@signalharbor.com). Until next month, happy monitoring!

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## A Gem of a Frequency

**T**here are thousands of military frequencies in the HF (High Frequency) spectrum to monitor, but a true gem among them all is a U.S. Navy frequency – 8971 kHz.

Old frequency guides refer to this frequency as “Kilo” or Atlantic Safety of Flight, but as monitors today will tell you, it is much more than that. This frequency now supports several important missions and activity is no longer limited to the East Coast of the United States.

### ◆ Maritime Patrol and Reconnaissance

The main mission you will hear on 8971 kHz, regardless of where you reside in the United States, is Maritime Patrol and Reconnaissance. P-3C aircraft support forces ashore and naval task groups at sea by conducting anti-surface, anti-submarine, surveillance, and mining operations.

### ◆ Tactical Support Centers

The U.S. Navy has 16 Tactical Support Centers (TSCs) worldwide which support maritime patrol aviation forces deployed overseas and at homeports within the United States. TSCs have state-of-the-art equipment to assist in mission planning, tactical aircrew briefing, flight following, and post flight mission data analysis for aircrews flying a variety of maritime patrol aircraft. U.S. Navy TSCs are equipped to support the following types of aircraft: P-3C Orions, S-3B Vikings, Canadian CP-140 Auroras, and the British Nimrod.

TSCs are a node of the Navy Command and Control System (NCCS) Ashore Network. TSCs provide round-the-clock command, control, communication, computers and intelligence (C4I) support for all Maritime Patrol Aviation (MPA) operations conducted in off shore waters.

The following is a partial list of known TSCs operating on 8971 kHz.

**Blue Star** - Naval Station Roosevelt Roads, PR: Also monitored on 4739.0 6693.0 and 14561.0 kHz

**Dog Fish** - Naval Station Keflavik, Iceland

Website: [http://www.naskef.navy.mil/command\\_fleet\\_air\\_kef\\_all.htm](http://www.naskef.navy.mil/command_fleet_air_kef_all.htm)

**Fiddle** - Naval Air Station Jacksonville, FL: Also monitored on 4739.0

kHz and 285.00 MHz UHF

Website: [http://www.cprw11.navy.mil/text/Tsc\\_TEXT.htm](http://www.cprw11.navy.mil/text/Tsc_TEXT.htm)

**Golden Hawk** - Naval Air Station Brunswick, ME: Also monitored on 4739.0, 8980.0 and 11205.0 kHz

Website: <http://www.cpw5.navy.mil/tsc.htm>

**Habitat** - Naval Air Station Whidbey Island, WA Monitored on 4703.0, 5699.0, 6718.0, 8977.0, 9004.0, 9010.0, 11187.0, 11211.0, 15093.0

Note: This station has not been reported on 8971.0 kHz.

Website: <http://www.naswi.navy.mil/ascomm/>

Address: Officer in Charge, TSCOMM DET Whidbey Island, NAS Whidbey Island Bldg 2771, 835 W Prowler St, Oak Harbor, WA 98278-4300

**High Voltage** - Possible ASW Exercise Controller from an unknown location. Also reported on 4739.0 kHz

**ICM** - NS Sigonella, Sicily, Italy 6693.0 [Tentative]

Website: <http://www.sicily.navy.mil/tsc/>

Note: This station has not been reported on 8971.0 kHz and not much is currently known about its operation

Address: Tactical Support Center, PSC 812 Box 3270, FPO AE 09627-3270

**Western Sky** - This station is believed to be located at NAS North Island, CA

### ◆ A Sky Full of Aircraft

In addition to the shore stations mentioned above, P-3 Orion aircraft are the largest users of the 8971 net. One way to tell if you are listening to an east or west coast aircraft is by the number following the code word. A general rule is 7## identifiers are east coast and 8## are west coast. There are exceptions to these rules such as tactical identifiers (i.e., Cardfile 71A), NATO tri-graph callsigns (i.e. S7J), and tail code identifiers (i.e. LK26A, etc).

Here is a partial list of aircraft that have been monitored.

#### East Coast Assets

Cardfile 7##/71L	VP-30 (FRS) NAS Jacksonville, FL (P-3)
Fighting Tiger 7##	VP-8 NAS Brunswick, ME (P-3)
GoreTex 7##	Unknown unit working Fiddle
Greenburg 7##	Unknown unit working Golden Hawk
LK 26L	VP-16 NAS Jacksonville, FL (P-3)
LL ##	VP-30 (FRS) NAS Jacksonville, FL (P-3)
LV 66L	VP-66 NAS Willow Grove, PA (P-3)
LY 7##	VP-26 NAS Brunswick, ME (P-3)
Mad Fox 7##	VP-5 NAS Jacksonville (P-3)
Molson 7##/33L	CanForce CP-140 Aurora aircraft
Pelican 7##/71L	VP-45 NAS Jacksonville, FL (P-3)
PZ 3##	VP-94 NAS New Orleans, LA (P-3)

Quartet 7##

Red Claw 7#L/##

Red Lancer ##

S4JG

Salty Dog ##

Spangle 7##

Swordfish 7##

Trident 7##

Wafer ##/7##

#### West Coast Assets

Demon 8##

Dragon Claw ##

Fargo 8##

Livingston 8##

Red Hawk ##

Renegade ##

Sea Lion 8##

Striker 8##

Waverunner 8##

P-3 aircraft callsign for aircraft on counter narcotics mission.

Probable VP-94 NAS New Orleans, LA (P-3)

VP-10 NAS Brunswick, ME (P-3)

General call used by all US Navy fixed wing aircraft while on ground for radio checks.

P-3 aircraft unknown unit

P-3 aircraft unknown unit

VP-65 NAWS Pt Mugu, CA (P-3) This squadron was the first WC squadron to deploy to the Carib for counter narcotics operations in 1998. Another possibility is VP-26 NAS Brunswick, ME (P-3). Both squadron are nicknamed the Tridents.

VP-92 NAS Brunswick, ME (P-3)

### ◆ Listening into the Background

If one carefully monitors this frequency a second net will reveal itself, comprised of some of the same players as mentioned above. The difference between the two nets is that instead of looking for something under the sea, these assets are looking for something on the sea or above it – narcotics runners. I call this second network the *Blue Star CN net*.

On this network, operations revolve around units contacting Blue Star (see above) exclusively during their mission phase of operations. These military units are watching the Caribbean for drug smuggling activity.

Some of the callsigns that have been monitored include:

## Alpha

## Bravo

## Charlie

Black Hawk

Falcon ##

Gremlin ##

Greyhound

US Coast Guard HH-65A Helicopters

US Coast Guard HU-25 fixed wing aircraft

US Coast Guard HH-60J Helicopters

Possible US Customs Service aircraft

Dutch Navy, Halo Curacao, Netherlands Antilles P-3 aircraft

US Navy E-2C aircraft

US Coast Guard Cutter Gallatin

Hunter ##	RAF Nimrod aircraft
Jacks ##	Unknown aircraft
Lancer ##	Unknown aircraft
Lookout ##	VAW-78 NAS Oceana, VA E-2C aircraft
Manzana ##	Unknown aircraft
Mongoose ##	Unknown aircraft
Mustang ##	Unknown aircraft
Newport ##	Unknown aircraft
Octopus ##	RAF Nimrod aircraft
Python ##	US Department of State International Narcotics Mission Air Wing Patrick AFB, FL (C-27 aircraft)
Rambler ##	Unknown aircraft
Razor ##	US Navy E-2C aircraft
Rebel ##	US Navy aircraft
Redwood ##	Unknown aircraft
Sea Hawk ##	VAW-126 NAS Norfolk, VA E-2C aircraft
Shadow ##	Dutch aircraft
Shark 21	US Coast Guard Cutter Valiant
Shark 44	US Coast Guard Cutter Block Island
Stalker ##	US Army Helicopters
Sting Ray ##	US Coast Guard HU-25A aircraft
Tomahawk	US Coast Guard Cutter
Wizard ##	US Navy E-2C aircraft
Wolf ##	VAW-77 NAS Atlanta, GA E-2C aircraft

#### Callsign: Blade ##

1.	275.8	121.75	Vandenberg AFB Ground/Clearance Delivery
2.	326.2	124.95	Vandenberg AFB Tower
3.	327.8	124.15	Los Angeles ARTCC
4.	269.5	119.05	Los Angeles ARTCC
5.	311.0		ACC Command Post (Spaceport)
6.	251.9	119.50	76th Flight Command Post (Blade Ops)
7.	256.0	121.40	Range Control (Frontier Control: 30th Space Wing)
8.	282.2	123.10	Search and Rescue Scene
9.	236.0		Ops Backup
10.	343.3		Vandenberg AFB Metro
11.		122.825	Irene Primary
12.		123.05	Irene Secondary
13.	272.0	132.75	Edwards Radar (Joshua/Sport)
14.	379.9	124.00	SLO Tower
15.	321.4	120.55	Santa Barbara Approach West
16.	242.2		Santa Barbara Muni Tower
17.		122.70	LOM/Oceano
18.		122.80	Santa Ynez
19.	289.6	118.30	Santa Maria Public/Capt G. Allan Hancock Field Airport
20.	255.4	122.30	Hawthorne Flight Service Station

15.	288.1	Brown Tower
16.	356.8	North Island Clearance Delivery
17.	255.4	Flight Service Station
18.	277.8	Fleet Common
19.	291.2	Lamps Common
20.	281.3	MK III Tactics

Other frequencies of note include in their operational load include:

355.5	North Island Base Operations
344.6	North Island Metro (weather)
382.2	Camp Pendleton Tower
360.2	Camp Pendleton Ground
267.6	Camp Pendleton ATIS
325.0	Point Mugu Approach
382.8	Point Mugu Tower
360.2	Point Mugu Ground
277.2	Point Mugu ATIS
382.8	MCAS Yuma Tower
340.2	MCAS Yuma Ground
360.2	El Centro Tower
263.4	El Centro Ground
271.7	El Toro Tower
383.8	El Toro Ground
284.2	El Toro ATIS
278.8	San Clemente Tower
265.1	San Clemente Ground
269.4	Montgomery Tower
257.8	Gillespie Tower
270.9	San Diego International/Lindbergh Field Tower
315.6	Miramar Tower

#### ◆ Happy Hunter Revisited

In the May edition of this column I asked the question "Who is Happy Hunter?" Several readers responded including Laura Quarantiello and Mark Zurovski. Laura notes the following:

"I recall that you asked about the 'Happy Hunter' callsign in a previous column. I've heard 'Happy Hunter' for years here in San Diego. They now go by the callsign 'Hunter' and usually control the civilian Learjets (Phoenix Air) that work with the

Navy, as well as other aircraft. I believe they are based at North Island and train air intercept controllers. Frequencies I've heard are: 255.3 284.9 285.8 304.2 318.7 355.1. Also, 122.775 is the Phoenix Air discrete."

Mark provided the last clue we needed to identify this mystery station. Based on internet web searches he discovered that "Happy Hunter" is the Sea Combat Air Controllers (SCAC) at the Fleet Combat Training Center Pacific in San Diego. Personnel working this callsign control and tactically employ all service combat aircraft in support of Sea Combat Commander (SCC) for Undersea Warfare (USW), Surface Warfare (SUW), support and logistic missions during normal and emergency operations in the southern California area.

Many thanks to both Mark and Laura for their help in solving this mystery callsign. And that will wrap it up for this edition of *Milcom*. Until next time 73 and good hunting.



So give 8971 kHz a try on your short-wave radio dial. You will be amazed at some of the traffic that will be heard there. We are especially interested in what our west coast readers are hearing on this frequency. You can contact this columnist at the email address in the masthead.

#### ◆ Van Nuys Air Expo

During this year's Van Nuys Air Expo Airshow, *MT Milcom* regular Mark Zurovski obtained frequencies for two west coast Navy/Marine Corps helicopter units. The following came from a communications placard in a MH-1N (Tail #69660 "HV") of the 76th Helicopter Flight based at Vandenburg AFB. Thanks, Mark, for the update.

The HSL-41 Seahawks, the west coast training squadron flying the SH-60B, use the following frequency lineup in their aircraft.

#### Callsigns: Island Ruler ##, TS ##

1.	384.4	Seahawk Base Radio (HSL Fleet Squadron Common-LVH)
2.	283.0	North Island ATIS
3.	352.4	North Island Ground
4.	336.4	North Island Tower
5.	276.2	Imperial Beach NOLF ATIS
6.	271.4	Imperial Beach NOLF Tower
7.	285.9	Imperial Beach Ground
8.	304.2	Happy Hunter
9.	301.9	Long Rifle (MCB Range Control Camp Pendleton-LVH)
10.	282.0	Beaver ATIS (FACSFAC San Diego-LVH)
11.	289.9	Beaver Control
12.	285.2	San Diego Approach
13.	318.8	Imperial Beach Radar
14.	389.9	North Island GCA

## LPFM on the air

**S**omewhat to the chagrin of the National Association of Broadcasters (<grin>, I think...) the FCC is continuing to issue permits for new Low-Power FM (LPFM) stations. We now have the first such station on the air.

According to information posted on the Worldwide TV-FM DX Association's mailing list, KCJM-LP came on the air in Alexandria, Louisiana, on June 20. KCJM-LP operates on 107.9 MHz with 100 watts ERP and an 84-foot tower. The licensee is "M & M Community Development, Inc."; LPFM consultant John Broomall told the list the station airs religious programming for inner-city residents.

These tiny stations will not be easy to DX, but the prospect will not be *impossible*. I've heard K228DL, an 80-watt FM translator in Yuma, Colorado, at my location near Nashville via sporadic-E skip. (Twice!) And 220-watt KBCM Blytheville, Arkansas, has made the 200-mile trip to Nashville via tropospheric propagation. The difference between 100 watts and 220 is negligible for DX purposes. LPFM stations are required to originate much of their programming locally – which may make them easier to identify.

As of my deadline, 25 LPFMs have received callsigns. They're listed in the sidebar.

Speaking of FM DX, *fantastic* sporadic-E openings occurred on two days in late June. June 27 was the big day in the Northeast; the 28<sup>th</sup> was the big one for us further to the west. Thirty-three new stations went into my log. Sporadic-E at FM rarely allows distances of more than 1300 miles or less than 700. But KUFM Missoula, Montan, and KIKX Ketchum, Idaho, both made it in at over 1500 miles, and KXAL, KTYL, and KFRO in northeast Texas appeared at just over 500 miles.

Very short skip implies very high maximum usable frequencies. When FM signals start to appear at distances of less than 700 miles, it's time to start looking for skip on channel 7. Bob Timmerman in Fort Wayne, Indiana, saw some. He had about five minutes of Mexican programming on channel 7 at the peak of the June 28<sup>th</sup> opening. There was no way to conclusively identify the station, but Bob suspects it was XHAB-TV Matamoros, and he's probably right. Oh, did you think it's necessary to have huge antennas to successfully DX FM

and TV? Bob was using rabbit ears...

### Over-the-Air Over?

There is now some discussion in government of something that would have been unthinkable just a few years ago – the complete elimination of over-the-air television in the U.S.. The transition to digital television is taking longer than many had hoped, and consumers are not buying the digital receivers. Digital television was always a financially-questionable concept for broadcasters. The recent economic downturn has not helped. Broadcasters had hoped to pay some of the cost of digital conversion by leasing extra bandwidth in their digital signals for other services. But a recent FCC decision allowing cable TV systems to strip out anything besides the main free-to-air program has made it unlikely many viewers will receive these extra services.

Delays in the conversion to digital TV result in delays in the freeing up of TV channels 52-69. The digital conversion is designed to relocate all stations from these channels to channels 2-51. Of course, if the conversion doesn't happen the channels won't be freed. In the meantime, cellular-telephone interests are chomping at the bit for access to these frequencies. And the government is anxiously awaiting the revenue to be earned from auctioning these channels. The possibility that broadcasters will continue to require these channels for another 10 or 15 years does not sit well with either group.

At the same time, fewer and fewer people are actually watching over-the-air television. In most markets, over 70% of homes have either cable or a mini-dish. The homes that don't are usually the ones whose owners don't watch

### LPFM callsigns issued

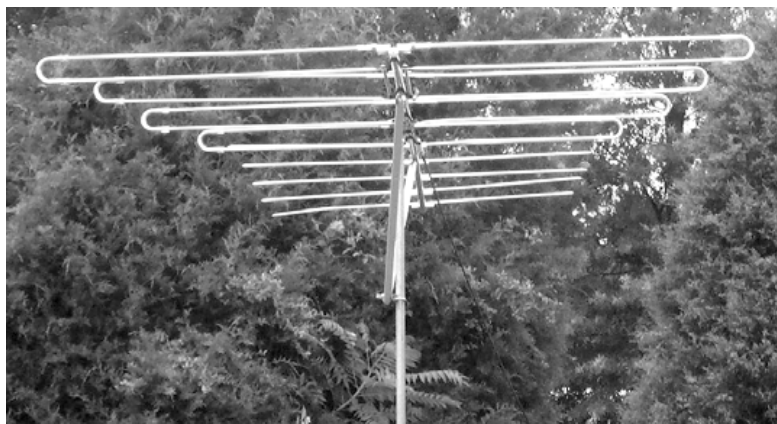
Juneau, AK	KBIZ-LP	94.1
Georgetown, CA	KFOK-LP	95.1
Lucerne, CA	KPFZ-LP	104.5
Oroville, CA	KRBS-LP	107.1
Red Bluff, CA	KRBH-LP	107.7
Turlock, CA	KEFC-LP	100.5
Fort Valley, GA	WLVN-LP	97.1
Frogtown, GA	WFNG-LP	100.5
St. Simon's Is., GA	WWEZ-LP	94.7
Trenton, GA	WSDA-LP	98.7
Marion, IN	KWCW-LP	94.3
South Bend, IN	WSBL-LP	98.1
Alexandria, LA	KCJM-LP	107.9
Bastrop, LA	KURC-LP	95.7
Mansfield, LA	KEPT-LP	106.1
Ocean City, MD	WEES-LP	107.9
Sherwood, MD	WRYR-LP	97.5
Rockland, ME	WRFR-LP	93.3
Enid, OK	KLGB-LP	94.3
Enid, OK	KUAL-LP	104.7
Hennessey, OK	KCOC-LP	97.7
McAlester, OK	KJRM-LP	93.3
Newport, RI	WXHQ-LP	105.9
St. George, UT	KOEZ-LP	105.1
St. George, UT	KWBR-LP	105.7

much television – or don't have much money to buy what's advertised. Advertisers really don't care much about either group. At the station I work for, if the transmitter goes off the air, we have instructions to continue programming as if nothing had happened. For 80% of the audience, nothing *has* happened – they receive our signal via fiber-optic link and either cable or satellite.

Personally, I doubt over-the-air television will actually disappear in the next few years. Broadcasters may not have the clout of the cellular and cable industries, but they're not completely important in Congress either. We could, however, see some interesting lobbying battles and issue advertising.

### Bits and Pieces

Have you heard one of the new LPFM stations? Write me at Box 98, Brasstown NC 28902-0098, or by email to w9wi@w9wi.com. Good DX!



*This is my FM DX antenna. No, it's not good practice to beam directly into a tree!*



## Camp Meeting Radio

**A**lthough they are not pirates, **Adventist World Radio** has been operating two very low power transmitters from the site of religious "campmeeting" events across the United States this summer. According to Adrian Peterson of AWR, 91.9 FM and 1000 kHz MW are normally the frequencies in use, depending upon local interference.

The upcoming schedule includes September 28 and 29, as well as October 26 and 27 from Silver Spring, MD. A second set of broadcasts is scheduled October 5 and 6 from Columbia Union College in Takoma Park, MD. QSLs are promised via the Indianapolis address below. This is a great opportunity for some unusual QRP DXing of unlicensed broadcasts.

### ❖ Clandestine Radio Schedules

Clandestine Radio com, the great web site covering clandestine radio news, announces an improved schedule list for clandestine stations. You can check out <http://www.clandestine-radio.com/martin/crw-main.html> for this valuable internet service.

### ❖ What We Are Hearing

MT readers heard all of these stations this month. Most were on either 6955 or 6950 kHz, with the latter more likely after sunset.

**Bill's Militia Movement**- United Patriot Radio has attracted a parody station, sometimes on 6955 kHz but sometimes on UPR's frequency. (Belfast)

**Blind Faith Radio**- Dr. Napalm's classic rock is a pirate radio staple. (Uses blindfaithradio@yahoo.com e-mail)

**Bong Radio**- Sycko Radio appears to be the origin of this new Radio Free Euphoria clone. (None)

**Crunch Radio**- Rumors of their disappearance were premature. (None)

**CSIC**- Pirate Rambo, the mother of all Canadian pirates, has returned to the air, often using oddball frequencies such as 15055 kHz. (Merlin)

**KIPM**- Alan Maxwell remains the king of marathon shortwave radio drama productions. (Elkorn)

**KRMI**- Radio Michigan International, also rarely using **WRMI** call letters, plays an unusual version of "O Canada" on a dissonant guitar. (Uses KRMI6955@hotmail.com e-mail)

**Mr. Science Radio**- This old-timer made a comeback this year, but the duration of the reactivation remains unclear. (Belfast)

**Partial India Radio**- Sanjay Ghandi and Harold Krishna parody both pirates and India's international broadcaster. (Providence)

**Radio Alpha Lima**- This Europirate, widely heard in North America on another ex-BBC frequency of 15070 kHz, has a [http://www.geocities.com/alfa\\_lima\\_international/](http://www.geocities.com/alfa_lima_international/) web site. (Hoogeveen)

[www.geocities.com/alfa\\_lima\\_international/](http://www.geocities.com/alfa_lima_international/) web site. (Hoogeveen)

**Radio Bingo**- The radio bingo game is still active, despite its rigged nature. (Merlin)

**Radio Free Euphoria**- Captain Ganja has a one track mind, and this track is associated with drug advocacy. (Belfast)

**Radio Free Texas**- It's been eleven years since we've heard this ID. Their return featured rock music and a loony tunes sign-off jingle. (None announced)

**Radio Neptune**- Varied shows from the Universal Service of this station show evidence of good production standards. (Blue Ridge Summit)

**Radio Therapy**- They were not widely heard, but veteran Hans Johnson of Cumbre DX pulled them in. (None)

**Radio Three**- Sal Amoniac mixes syrupy pop rock and pirate advocacy. (None, QSL's logs in *The ACE*)

**Radio Tornado Worldwide**- Lately they have mixed audio segments from **Radio Metallica Worldwide** and Jimmy the Weasel of **WRX**. (unclear)

**Sycko Radio**- The news this month is that their active pirate operation might finally accept reception reports. (Try [psycoradiohd@yahoo.com](mailto:psycoradiohd@yahoo.com) e-mail)

**Take It Easy Radio**- They used to primarily feature music by the Eagles, but more varied rock and pirate radio discussions are now heard. (Belfast)

**The Crooked Man**- They are the all-time classic stream of consciousness station, with an announcer who hit his head while falling off the Hindenberg. (Old maildrop defunct)

**United Patriot Radio**- Despite false rumors of an FCC raid and a press release from the station saying that they closed down, this USA domestic clandestine continues semi-regular operations on 6880 and 6900 kHz. (Somerset)

**Voice of Captain Ron Shortwave**- The Captain's rock music is spiced with commentaries about the government. (Uses [captainron6955@hotmail.com](mailto:captainron6955@hotmail.com) e-mail)

**Voice of the Angry Bastard**- The identification is odd, but their fare is mostly rock music. (Belfast)

**WHYP**- James Brownyard's memorial station mixes rock, parody, and temperatures for Lake Erie cities. (Providence)

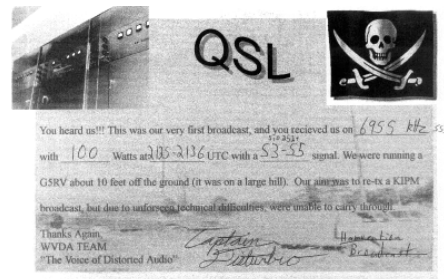
**WKND**- Veteran pirate Radio Animal has returned with his blend of rock music and pirate advocacy. (Blue Ridge Summit)

**WMFQ**- All identifications are by a chanting male chorus on this QSL advocacy station. (Providence)

**World Cruise**- Lee Silvi's ID was somewhat tentative on this one, but their Caribbean music was something you rarely hear on the shortwave bands nowadays. (None)

**WSRR**- They have affiliated with an internet feed at [http://www.solidrockradio.net/listen\\_live.htm](http://www.solidrockradio.net/listen_live.htm) on the web. (Belfast)

**WVDA**- As we see here this month, it's now clear that Captain Disturbio's Dayton



Hamvention premiere was not a one-shot wonder. (Uses [wvdapirate@yahoo.com](mailto:wvdapirate@yahoo.com) e-mail)

### ❖ Reports and QSLs

Reception reports to pirate stations require three first class stamps for USA maildrops or \$2 US to foreign locations. This finances postage for a souvenir QSL to your mailbox. Send your letters to these addresses: PO Box 1, Belfast, NY 14711; PO Box 28413, Providence, RI 02908; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 69, Elkorn, NE 68022; PO Box 29235, Indianapolis, IN 46229; 245 Elrod Martin Road, Somerset, KY 42503; PO Box 293, Merlin, Ontario NOP IW0, Canada; and Box 663, 7900ar Hoogeveen, Netherlands. A few pirates prefer e-mail, bulletin logs or internet web site reports instead of snail mail correspondence. Reports to the *Free Radio Network* (FRN) go to <http://www.frn.net/> on the web. *Free Radio Weekly* loggings go via [niel@ican.net](mailto:niel@ican.net) e-mail. Sample copies of *The ACE* are \$2 via the Belfast maildrop.

### ❖ Thanks

Your input is always welcome via PO Box 98, Brasstown, NC 28902, or via the e-mail address atop the column. We thank all of our contributors: Kirk Baxter, North Canton, OH; Jerry Berg, Lexington, MA; Artie Bigley, Columbus, OH; Jerry Coatsworth, Merlin, Ontario; Ross Comeau, Andover, MA; Captain Disturbio, Dayton, OH; Joe Filipkowski, Providence, RI; Bill Finn, Philadelphia, PA; Harold Frodge, Midland, MI; Vince Havrilko, Beale AFB, CA; Harry Helms, Ridgecrest, CA; Hans Johnson; Maryanne Kehoe, Atlanta, GA; Chris Lobdell, Stoneham, MA; Dr. Love, Belfast, NY; Greg Majewski, Oakdale, CT; Bill McClintock, Minneapolis, MN; Ed Muro, Long Island, NY; Adrian Peterson, Indianapolis, IN; Michael Prindle, New Suffolk, NY; Lee Reynolds, Lempster, NH; Martin Schoech, Merseburg, Germany; Tom Severt, Frontenac, KS; Lee Silvi, Mentor, OH; Bud Stacey, Setsuma, AL; Roland Stiner, North Arlington, NJ; Enrique A. Wembagher, Buenos Aires, Argentina; Lee Witham, San Diego, CA; and Niel Wolfish, Toronto, Ontario.

## First Steps

Newcomers frequently ask about the best way to get started in monitoring the longwaves. While there are many parallels to conventional shortwave listening, the low frequencies can present unique challenges for those just starting out. This column will explore what it takes to begin your journey, and hopefully help you avoid some common pitfalls.

Whatever your reason for wanting to explore the low frequencies, you can probably find something of interest. In a single listening session, you might hear time stations, low power experimenters, European broadcasters, navigation beacons (a major pursuit for many), or NAVTEX teleprinter transmissions. The more adventurous can even dip below 10 kHz to explore the realm of "natural radio." You could spend many weeks exploring the longwaves without covering the same ground twice.

### Equipment Needs

The first thing you're probably wondering about is a receiver. Today, many radios include longwave coverage—down to at least 150 kHz. This is probably the biggest factor in longwave's renewed popularity. If your receiver doesn't cover longwave, or you wish to go below 150 kHz, you can always put a converter in front of it that "moves" a slice of the longwave band (typically 10-530 kHz) to a convenient shortwave band.

The converter route is an excellent choice for two reasons. First, it requires no modifications to your receiver; it simply connects between your antenna and your receiver's RF input. Second, all of the features your shortwave rig offers can be fully applied to longwave signals (S-meter, notch filter, BFO, perhaps a digital frequency readout, etc.). One firm currently offering converters is LF Engineering Co., 17 Jeffry Road, East Haven, CT 06512. You can check them out on the web at <http://www.lfengineering.com>.

Antennas are another important consideration. If you currently have a "longwire" antenna for shortwave reception, by all means try it. As I've stated here many times, such antennas can work very well in a reasonably quiet environment, especially if they are at least 100 feet long. Rural or light suburban areas offer the best chance for success with wire antennas.

Active antennas and loops also make excellent choices for longwave. Although physically small, these antennas will often outperform wire antennas and usually provide lower-noise reception. LF Engineering Co. is also a

source for these types of antennas. More information on LF antennas (including homebrew ideas) can be found in the June, July and August 2001 issues of *Below 500 kHz*. Reprints are available from *Monitoring Times* at \$3 each.

### On the Air

With your basic receiving equipment in place, it's time to start listening! Chances are, you've been told that longwave is a "nighttime band." While it is true that more distant stations are typically heard only at night, the daytime hours provide a good opportunity to learn about the "regulars" in your area—useful reference points as the band fills up at dusk.

Well-meaning listeners may also tell you that longwave is only a "wintertime band," but this is not the case. Of course, natural static (QRN) will be much lower during the winter, but there are many longwave signals to be heard at other times of the year. Some of my best intercepts have been during the summer months, before 10 a.m. when noise is low.

My best advice for beginners is to turn the receiver on and just start listening. A convenient place to begin might be the beacon band (190 to 530 kHz). This spectrum is sprinkled with unmanned, low power stations sending their Morse Code IDs repeatedly. Their official purpose is to guide aviators along their routes, but many DXers find enjoyment in hearing as many beacons as possible—from as far away as possible.

Sometimes you'll be able to figure out the rough location of a beacon just by hearing its ID. Examples include: TUK—Nantucket, JFK—John F. Kennedy Airport, BU—Buffalo, CL—Cleveland, and so on. Other times, you can identify beacons from past loggings in *Monitoring Times* or in specialty publications such as the *Lowdown* (described below). Can't copy code? Don't worry; these stations send their ID slow enough for you to write down the dots and dashes to look up later on a Morse chart.

### References

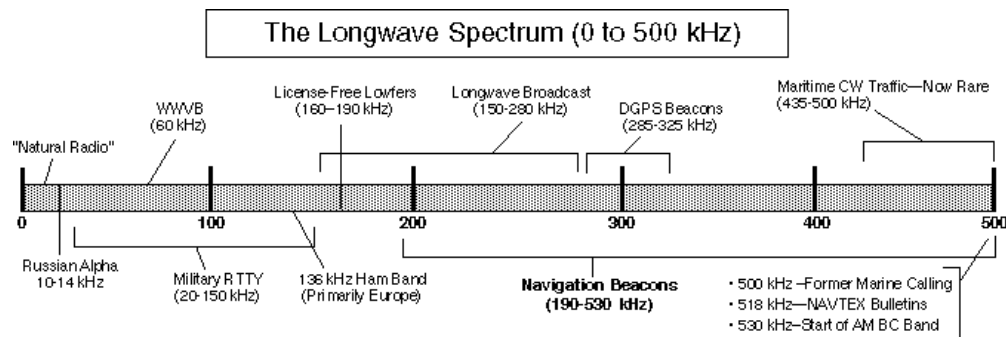
Eventually, you'll probably want to have a directory that you can use to determine a beacon's exact location. I am not aware of any online source that lists *all* beacons in North America, but the website at <http://www.airnav.com> is a good place to start. Unfortunately, it omits the 2-letter "compass locator" beacons.

Since 1997, I have published the *BeaconFinder* guide that lists virtually all North American Beacons (US, Canadian, Mexican), plus many from adjoining territories that are commonly heard in the US. Copies of the guide are available for \$11.95 (postpaid) in the US and Canada, and \$14.95 elsewhere. Orders may be sent to Kevin Carey, P.O. Box 56, West Bloomfield, NY 14585. More information about this and other LF resources is given on Alan Gale's Beacons & Utes page at <http://www.alan.gale.clara.co.uk/datafile.htm>.

In my opinion, one of the best investments a newcomer can make is a membership in the Longwave Club of America, Levittown, PA 19057. The LWCA publishes the legendary *Lowdown* journal, which contains technical articles, loggings and correspondence from members all over the world. There's also a section that helps listeners identify "difficult" beacons that cannot be found elsewhere. Membership in the LWCA is \$18 in the US, \$20 in Canada and Mexico, and \$26 overseas by airmail. Check out the LWCA web site at <http://www.lwca.org>.

### Next Time...

Obviously, there are many other signals you can hear besides beacons. I had hoped to discuss some of these in this column, but I am nearly out of room. I will hold on to them until October. For now, the spectrum chart in Figure 1 will help get you started. 73, and Best DX.

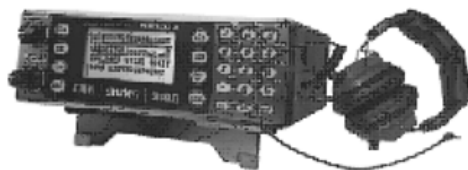


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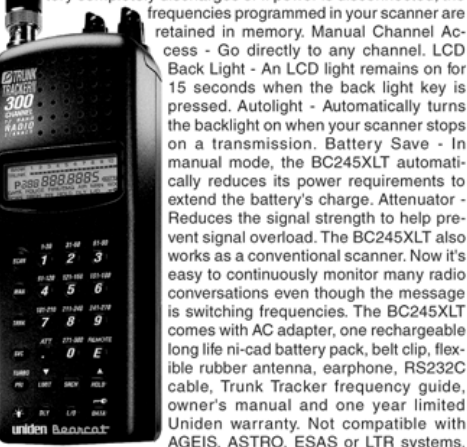
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## Ham Radio Rises Again!

**L**ike many folks, my formative years were the sixties and seventies. (That alone could be the topic of several books, but we're here to talk about ham radio.) Those were exciting times. It should not be surprising to anyone that it was also an exciting time for amateur radio.

Within that period you found folks working with vacuum tubes, transistors and integrated circuits. All were valid and practical, given the situation. I even recall a few amplifier circuits that made some use of all three!

As a newly minted ham, I was trying my best to learn my way around in this fertile environment. Throughout that time there was a magazine that took design and construction most seriously. It was called *HAM RADIO*. *Ham Radio Magazine* was published from March 1968 through June 1990. During that time it served as the premier journal for amateur radio. I have to admit, more than a few of the articles were well over my head. The engineering was as solid as any you would find in a professional publication. But like most dedicated hams, I read, I studied, I learned.

After *Ham Radio* left the newsstands, two other journals written in a similar style hit the streets. *Communications Quarterly*, the CQ Communications' "heir" to *Ham Radio*. Also there was The American Radio Relay League's *QEX*, which started out as a newsletter and went on to become the full blown magazine that it is today. The fortunes of the publications world being what they are, recently the ARRL bought out *Communications Quarterly* which led to access to the rights to good old *Ham Radio*.

When this deal went down, more than a few folks in the know picked up the phone to League HQ to beg and plead that they make *Ham Radio* back issues available once more. As you may know from past columns, the ARRL has made every issue of their magazines available in CD ROM format – a treasure of information for any ham or student of the radio hobby.

Well, I am happy to tell you that The League took up the task and the back issues of *Ham Radio* can once again be pored over by anyone who has a desire to build, experiment and learn the best that amateur radio has to offer from some of its best thinkers.

I've moved my QTH about four times since *Ham Radio* stopped publishing and the meager collection of issues remaining in my library are dog-eared and musty. Interestingly, you very rarely see these magazines up for sale at hamfests. Folks who have them tended to keep

them. That problem is now solved thanks to personal computer technology.

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Let's get the preliminaries over with. I really want to talk about what's in the magazine itself. Each four CD-ROM sets includes high quality black-and-white scanned pages designed to be read on your computer screen or printed. The disk sets are complete in every way: archive quality including the articles, ads, columns and covers. This gives the reader the opportunity to experience this magazine essentially as it was editorially presented in its original printed form.

System requirements are a Pentium or equivalent IBM-compatible PC (I have successfully installed the disks on a machine as slow as 60 MHz), and Microsoft Windows™ 95, 98 or NT 4.0. (I am assuming that the NT 4.0 designation means the disks will also work on Windows 2000 systems as well, but that is not verified.) Incidentally, something readers will want to know, and the publishers at ARRL HQ should verify, is if these disks can be used successfully with the Windows emulation programs that run under the Mac or Linux operating systems.

The search engine program that makes poring over the *Ham Radio* back issues a pure pleasure is the ARRL's own AView. This system allows the user to search by Title Words, Year, Month, or the author's Last Name, First Name or even Callsign. Also included is the ability to search by any regular monthly column title.

These are useful functions, for certain, but if you are like me, you are going to enjoy just cruising through the magazines, issue by issue, in search of the wonders of amateur radio within. I can assure you that I have gotten very little done around the shack since these disks hit my doorstep. I have, however come across a number of notable articles to give you an idea of what makes these disks a worthwhile addition to your shack.

### ◆ Ham Radio CD-ROM 1968-1976

The first 15 pages of the February 1968 Premier Issue is included in the collection. But it is the March 1968 First Issue under the able direction of Jim Fisk W1DTY that set the stage for the level of competence and quality that *Ham Radio* would be known for throughout its history.

The first feature article was a five-band SSB exciter. This was not simply a schematic diagram and a "good luck OM" story. The article even went into detail as to how to construct the case that the unit was to be built in. This is applicable to almost any radio project you might consider constructing even today.

You need to remember that, even in 1968, the "Sideband Wars" were not over. I am sure this design won over more than a few AMers to the new way of doing ham radio. And while this was a tube design, the gold standard for home construction back then, this first issue included an article on IC-regulated power supplies. Back then this was big doin's. Now, most soldering savvy hams can construct such a circuit blindfolded.

A watershed article for lovers of older gear appeared in the February 1969 issue entitled "Converting a vacuum-tube receiver to solid state." In it, the author Hank Cross W1OOP modified a BC-348 using MOSFETs and JFETs. Folks who love classic gear but who are finding tubes harder to find could still learn a thing or two from this story.

*Ham Radio* always had great antenna articles. One design I have seen used at several locations even today is a Three Band Groundplane found in the May 1972 issue. What *Ham Radio* offered to its readers was not just the design but the theory radiation patterns and "Smith" charts to support the design's effectiveness. This wasn't the exception. At *Ham Radio* it was the rule.

5/8 wavelength verticals for 2 meter mobiles are pretty much the industry standard these days. The May 1976 issue includes a design by Joe Pentecost K4LPQ that includes the novel approach of using the coax as a matching stub to eliminate problems inherent in using loading coils in similar applications. Further, the design's unique use of tubular stock for the radiator makes for an antenna that would be very sturdy and ideal for use in harsh conditions.

## ◆ Ham Radio CD-ROM 1977-1983

I have always had a soft spot for direct conversion receivers. Their simplicity and even some of the design challenges they present (broadcast band overload, etc.) create a high "fun" quotient. Over the years a number of these designs have graced the pages of *Ham Radio*, but one I've had some fun playing with appears in the January 1977 issue. This article proved to be so popular that its author Dick Rollema PA0SE followed it up with a deeper study of the design in the November 1977 issue.

One issue I have maintained in "hard copy" throughout all my moves is the March 1978 Tenth Anniversary Issue. It includes dozen of great articles, but two rise up in my mind even now. First is a great study and tutorial on the "Smith" chart. Once you get a handle on this unique tool you discover just how much knowledge can be derived graphically from a few relatively simple calculations. The other article is an amazing portable HF SSB/CW transceiver. For years I dreamed of building such a rig. Now, having constructed the Elecraft K2, I can see many of the basic design principals that I first discovered back in 1978.

Anyone who was a ham in the early eighties remembers our battles with the Russian

"Woodpecker." This "Over the Horizon" radar system threatened effective amateur radio communication. No less a designer than the world renowned Ulrich L. Rohde DJ2LR stepped up with a noise blanker design that helped a lot of folks out during those difficult times. Rohde's appearance was neither his first or last. This was the regular caliber of the contributors to *Ham Radio* over its lifetime.

## ◆ Ham Radio CD-ROM 1984-1990

*Ham Radio* was also known for great, often low-cost, test equipment designs that would rival lab quality equipment. Many of these devices remain in daily use in the amateur radio community. For example, John Bailey's Wide-range Ohmmeter in the January 1984 issue.

Also, while hams had been playing with personal computers since they first showed up in the seventies, the early eighties brought dozens of articles about practical uses for these PCs. An example of this is I.L. McNally K6WX's Moon-

tracking program originally written for the Radio Shack TRS-80. It's a lot of fun to see how far we've come since those early, experimental, days of personal computing. It's also important to remember that hams lead the way and their work in this area often appeared in *Ham Radio*.



Some articles continue to amaze me even after the years have jaded me to most things. Take Frank Kalmus WA7SPR's design for a mobile kilowatt amplifier that appeared in the February 1985 issue. While I know in my head that this design is the model of efficiency I can't shake the mental picture of a car with its headlights dimming every time the driver hits his microphone button.

Even the final June 1990 issue reflected the continued standards that made *Ham Radio* stand out with articles on such subjects as Ground Mounted Vertical Antennas, Microwave Basics, a circuit for a Precision Crystal Frequency Checker and Diversity Reception on HF Digital Communication.

We don't want to forget some of the great columnists that appeared throughout *Ham Radio*'s issues. These would include none other than Bill Orr W6SAI who was one of the most prolific radio writers in our hobby's history. His "Ham Radio Techniques" column remains a great source of knowledge even today. And of course there was also Joe Carr K4IPV, another well known and prolific radio writer, and his "Practically Speaking" column. And if you look in the June 1981 issue you will find an article by somebody named Bob Grove WA4PYQ called "Tune in the World, Tips to Getting Started in Short-wave Listening." Doesn't he have something to do with another radio hobby magazine?

These CDs would make an excellent addition to any radio hobbyist's collection. Give them a look when you get the chance.

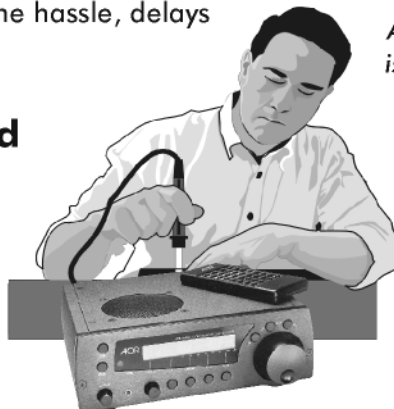
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## Realignment and Testing of the SW-54

Last month we brought the National SW-54 back to life, and it seemed to be acquitting itself nicely in a casual listening session conducted with just a few feet of antenna right on the workbench. Now it was time to perform a realignment on the set to correct any drift on the original 50-year-old factory adjustments.

### ◆ Setting up for Alignment

Even though this is a multiband set, the alignment procedure is basically identical to the one we conducted on the Philco *Transitone* that was our first radio restoration project (see April, 2001 column). I don't want to spend a lot of time going over all of the material we covered then, but I'll mention again the tools and instruments required for an alignment.

You'll need a few sizes of non-conductive screwdrivers. Because we are working with radio frequency signals, metallic ones would change resonance points and throw off adjustments. Also, some i.f. transformer adjusting screws carry B+ voltages. With a metal screwdriver you could create a destructive short circuit and/or shock yourself. Generally a smaller size is needed to slip through holes in i.f. transformer cans and engage the i.f. adjusting screws; a larger one for turning the adjustments of the r.f. and oscillator trimmer capacitors.

The latter screws often become partially frozen and hard to move over the years. Very handy in such cases is an insulated screwdriver with a very small metal blade set into the end for engaging the screws. The blade isn't big enough to affect adjustments, but it is much more rigid than a plastic blade and you can lean on it to move a sluggish screw.

For some jobs, you may also need various sizes of adjustment tools with hex ends (male and/or female). But most sets you'll be running into at this stage will not require these. All of the adjustments on the little SW-54 we are working on are standard screws.

You'll also need an isolation transformer, as I've stressed many times, if the radio is an a.c.-d.c. type as this one is. A good quality r.f. signal generator designed for radio service work, such as the Triplett Model 2432 we rehabbed in the February and March 2001 issues, should also be on your bench, as well as a multimeter with some low a.c. volts ranges to measure the changes in signal strength that will result from your adjustments.

It's always important – especially in multiband radios such as this one – to have the manufacturer's service instructions. They'll give you the location of the adjustment trimmers and the recommended sequence of adjustment steps.

I connected the multimeter as with the *Transitone* alignment – from the plate of the audio output tube to ground via a .1 mfd capacitor to block the d.c. See the April 2001 issue for a little diagram of the hookup. The r.f. generator was connected to the radio through a .01 mfd. Capacitor to the grid of the converter (sometimes called the first detector) tube. More on this later.

### ◆ The Dummy Antenna

We haven't needed to discuss dummy antennas before because they are not required for radios that have built-in loop antennas, as did the Philco *Transitone*. But the SW-54, which is intended for more serious listening on both the broadcast and shortwave bands, is set up for use with an outside antenna.

When aligning a radio like this, a "substitute" antenna needs to be connected to approximate the impedance of the antenna that will be used when the radio is put into service. Otherwise the alignment will not be as perfect as possible.

In some alignments, the signal generator is connected to the antenna terminals through a dummy antenna that consists of a little network of resistors and capacitors. The

capacitors help simulate the capacitive effect of the antennas feed-line, which might be TV-type twin lead. In this case, although the SW-54 will accept a twin-lead antenna connection, the manufacturer has been easy on us. We are asked only to wire a 300-ohm resistor across the antenna terminals. The signal from the r.f. generator is injected (through a capacitor as mentioned) directly into the signal grid of the 12BE6 converter.

### ◆ Terminology

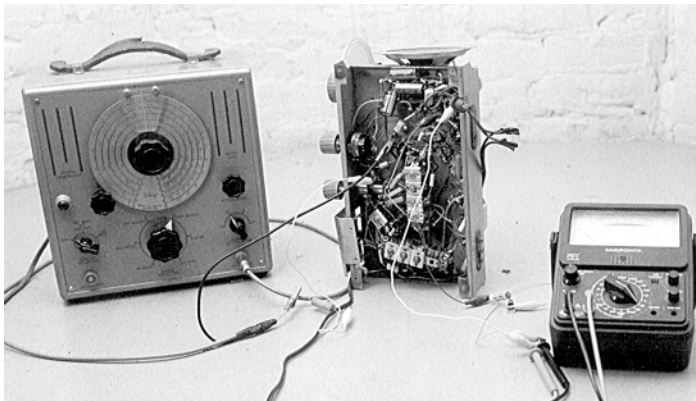
The converter tube, which may also be referred to as the "first detector," the "mixer," or the "oscillator-mixer," is the first tube encountered by the received signal in simple superheterodyne radios. It is commonly a type known as a "pentagrid converter." This is a dual purpose tube which serves (1) as an oscillator to generate the r.f. signal needed to mix with the received radio signals to convert them to a constant 455 kHz output signal for amplification in the i.f. channel and (2) to actually perform the mixing function. As the name suggests, it has five grids. The signal grid is the one which receives the radio signal from the receiver's antenna tuning circuits. Sometimes, especially in older receivers, the oscillator and mixer function are assigned to separate tubes. No doubt we'll run into such a case in a future restoration.

In the *Transitone* realignment we completed earlier, there were two trimmers to adjust in addition to those for the i.f. channel: the oscillator and so-called "r.f." trimmers – both located right on the main tuning capacitor. The oscillator adjustment controls the actual frequency received at a given spot on the dial; the "r.f." adjustment makes sure that the tuned circuits which select the received frequency coming in from the antenna are tuned exactly to that same spot on the dial.

In the SW-54, we have the same pair of trimmers to deal with, except that since the radio has three additional bands besides the broadcast band, there is a separate pair for each band – eight in all. And the trimmer referred to loosely as "r.f." in the *Transitone* alignment is here called by the more precise term "first detector," because the action of this trimmer tunes the signal input of the first detector tube.

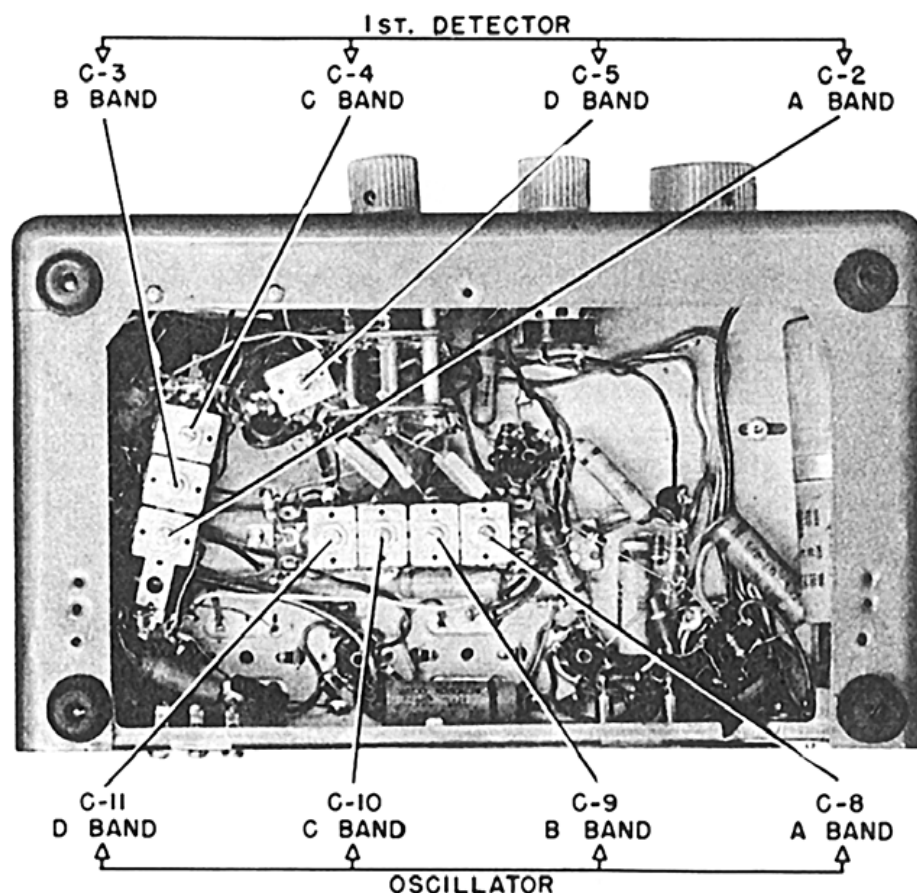
### ◆ Completing The Alignment

With the radio set up for alignment as described, the actual work was completed in less than an hour. First, the i.f. channel was aligned with the signal generator set to the set's intermediate frequency of 455 kHz. The i.f. transformers in this radio, instead of having fixed induc-



The SW-54 set up for realignment on my bench. Arrangement is virtually identical to that used earlier for the Philco *Transitone*.





*Illustration from instruction manual shows the oscillator and first-detector trimmers for the radio's four bands.*

tances tuned by variable trimmer capacitors, have variable inductances tuned by fixed capacitors. The tuning was done by screwdriver adjustment as usual, with the adjustment for the transformer secondaries accessible through the bottom of the cans and the primaries through the top.

Just as with the *Transitone* adjustment, I proceeded from the audio end of the radio to the r.f. end, with the secondaries adjusted before the primaries, tuning for maximum output. As always, I used minimum signal strength to avoid engaging the radio's AVC (automatic volume control) action. I didn't notice nearly as big an improvement in gain as I did when tweaking the *Transitone*'s i.f. channel, which is probably a result of the higher quality components built

into the radio by this major manufacturer of communications equipment.

Because there are a total of eight first detector and oscillator trimmers instead of two, they could not be built into the tuning capacitors as with the *Transitone*. Instead, they are mounted in rows atop their associated coils. I'm including a shot from the set's instruction manual in which these trimmers are shown and identified. This is a pretty standard setup for a small communications receiver.

The trimmers were adjusted for maximum output in the usual way – first the oscillator then the first detector for each band – with the signal generator set to the manufacturer's specified adjustment frequencies. There was one slight difference from the *Transitone* procedure. In the three shortwave bands (bands "B," "C," and "D,"), the first detector trimmers were adjusted to a slightly different frequency than the oscillator trimmers. This, I believe, is done to improve uniformity of sensitivity and tracking over the much wider frequency ranges of the shortwave bands. As with the i.f. adjustments, I did certainly make some improvement, but in general found that the original adjustments were still fairly close.



*It's nice to see the radio back together again for a listening test!*

## ◆ Listening with the SW-54

The evening following the realignment, I installed the chassis back in the cabinet, took the set out to my not-quite-completed backyard radio shack, and hooked it up to my temporary antenna (about 20 feet straight up into a tree). I was pleasantly surprised by this little charmer's performance. It may be just an overgrown "all American five" a.c.-d.c. home receiver, but the tuning knob worked smoothly with a velvety action and very little backlash. In spite of the fact that the calibration marks on the small slide-rule dial seem very crowded and close together, the stations separated easily and moved smoothly in and out of tune as I turned the dial.

I continued this enjoyable listening session for about an hour, long enough to hear a good representation of signals on each of the radio's four bands. My only disappointment was the tinny quality of sound coming from the radio's small speaker. I guess our modern ears have become accustomed to better.

This is a very nice little radio and I'm glad I picked it to bring back to life in this column. Since SW-54s are inexpensive low-end communications receivers, they turn up in flea markets and meets more often than their higher-priced cousins. And, as you can see, they are not only rewarding to restore, but also are not much more complicated than a simple broadcast receiver. If you find one and restore it, write and let us know about your adventures.

Next month we'll button up the SW-54, and also build an inexpensive isolation transformer for your work with a.c.-d.c. sets.

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## Some Very Unusual Antennas!

**T**he entries are all in for our Unusual or Weird Antenna Contest. The winning entry is the "Elephant Cage Antenna" (fig. 1A) submitted by *Monitoring Times* reader Jeffery L. Adams. This remarkable giant, one variant of the Wullenweber antenna design, covers about 40 acres, and contains literally hundreds of elements.

Although I don't have more specific information on the larger version, a smaller version which covers a circular area with a 900 foot (274 meter) diameter has 120 vertical antenna elements with 120 reflector elements, a second circle of 40 folded monopole elements, and a ring of reflectors for these monopoles.

These antennas are so large that their operations buildings are located at the center of the antenna itself! In these buildings you would find a number of radio-intercept operators, each of whom is equipped with several wide-range communications receivers. One model is designed to intercept and locate signals in the range of 30 kHz to 30 MHz, and it does just that with an accuracy of approximately plus or minus 3 degrees! Websites that feature Wullenweber antennas

include: <http://212.58.60.17/knowledge/archaeology/survey-diary/survey18.asp>, <http://members.tripod.com/~cobrasite/flr9pics.html>, and <http://users.neca.com/cummings/wullen.html>.

Thanks for entering this very unusual antenna, Jeffery; your prize from *Monitoring Times* is on the way.

Two antennas entered in the contest received honorable mention. The first was submitted by Rostan A. McPhee. Inspired by an article on fractal antennas which appeared in *Monitoring Times*, Rostan built the "Ice Crystal Fractal Antenna," (fig. 1B). This unusual antenna consists of a fractal active element in front of a similar fractal reflector. This antenna, which is designed for 10 meters, is much smaller than more traditional beam antennas, and is reported by Rostan to be very efficient.

Honorable mention also goes to *Monitoring Times* reader Charles Chenery who submitted a copy of an article appearing in the January 2001 issue of *Short Wave Magazine*. This article reports an unusual Russian antenna (fig. 1C) said to be capable of supporting the detection and location of offend-

ing radio transmitters at distances in excess of 1800 miles (3000 km) away. This data is then supposedly used in directing a bomb or missile strike to knock out the offending station! Is that zero tolerance for pirate radio, or what?

### Addendum:

Over the years I've run across a variety of other unusual antennas that I'd like to share with you now. For instance there is the Telerex® log-periodic beam antenna used by the military which has a boom length of over 64 feet, and weighs 1,400 pounds. This goliath boasts forward gain of 10-13.5 dB over the broad range of 6 - 40 MHz. The sister to this antenna covers 3 to 30 MHz, and weighs over a ton!

Underground and underwater antennas have been used since the early days of radio, although we seldom see them now. But what about putting the water up in the sky? Aubrey Fessenden, one of the great pioneers of radio communications, successfully used a stream of water from a water pump as an antenna for transmitting and receiving.

Another amazing idea that sounds all wet is reported in a 1962 issue of the *Proceedings of*

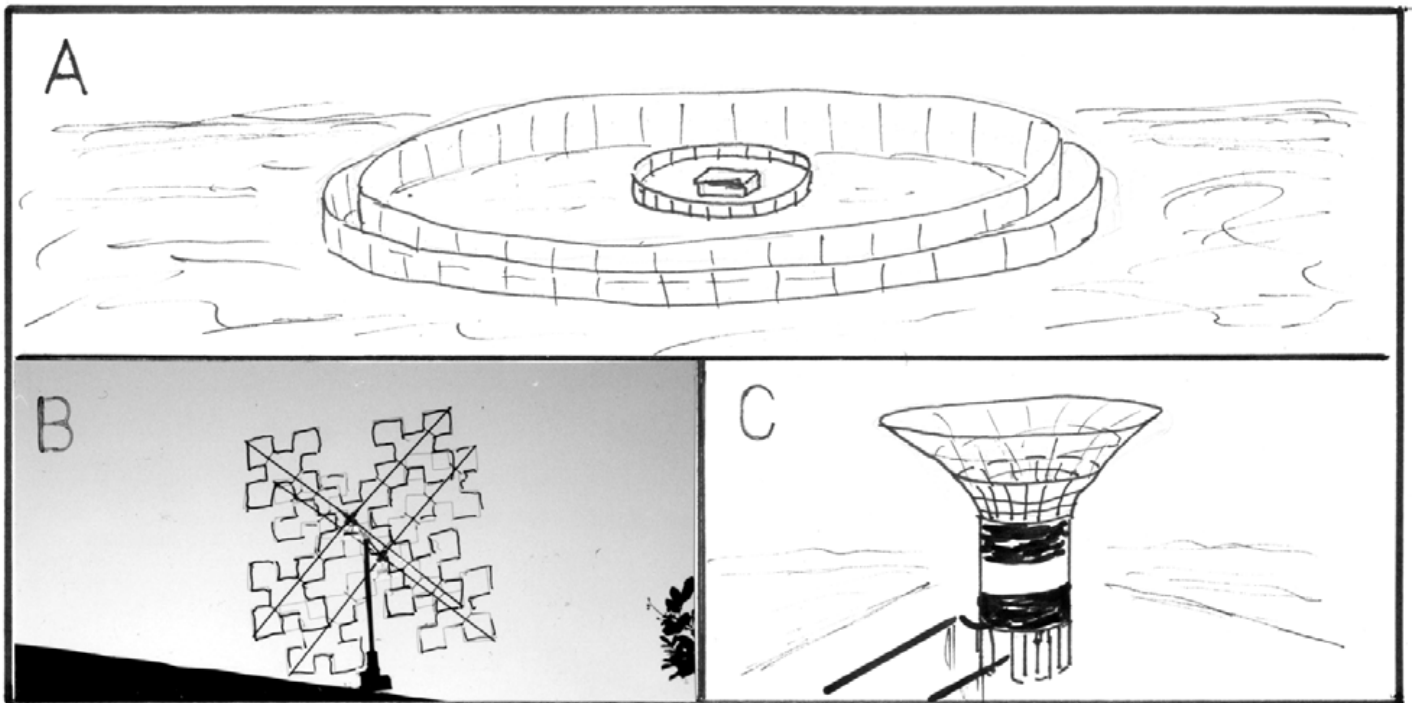


Fig. 1. An elephant cage antenna (A), a fractal "ice crystal" antenna (B), and a Russian signal-source locating antenna (C).

## This Month's Interesting Antenna-Related

### Web site:

For some unusual antennas try the following sites. They are not from the contest, and not necessarily great antennas, but they are all unusual:

<http://www.qth.com/dwm/yo-yo-tenna.htm>

features a "Yo-Yo" antenna – named for the toy on a string.

[http://www.geocities.com/swl\\_yb400pe/slinkyape.html](http://www.geocities.com/swl_yb400pe/slinkyape.html)

gives lots of info on an antenna made from a slinky toy!

<http://www.radiohc.org/Distributions/Dxers/broomstick.html> has an antenna using a broomstick ("ugly versions can be assembled in minutes,"),

<http://www.floatograph.com/police/antenna.html>

is a balloon antenna capable of withstanding hurricane-force winds, and

<http://stores.yahoo.com/direct/flasanwit6di.html>

caters to cellphone antennas with six different colored caps and flashing LEDs!

Send in your suggestions for inclusion here as an interesting antenna-related web site to: [clemsmall@hotmail.com](mailto:clemsmall@hotmail.com).

*the Institute of Radio Engineers*. There an article suggests that: "One fascinating idea that should have a great future is the plan by Morgan to use an island in the ocean as an antenna." When this idea was tested, the crazy-sounding system actually worked!

Back in the early days of tube-type radios, beds had bare-metal spring systems under their mattresses. It was not unusual for a radio experimenter to hook a lead-in to their bed springs, and use the springs as a receiving antenna. Out on the farm, radio experimenters were just as creative, often using barbed-wire fences as antennas. I once successfully used a metal dog-run cable (similar to a clothes line) as an antenna for my ham radio transceiver.

The antennas just mentioned might seem too low for much success, but the great Marconi actually reported laying antennas directly on the desert sands in Libya, and using them for wire-less communication.

Over the years I've seen a number of reports of successful use of trees as antennas. Lee DeForest, the self-styled "Father of American Radio," reported using a growing bush as the ground in a receiving-antenna system. And I've seen reports claiming satisfactory results using automobiles, truck-mounted aerial ladders, metal window frames, metal roofs, and even metal rabbit cages as antennas.

### The Tall and Short of It:

We once ran a contest in this column to find the world's largest and smallest antennas. Entries included a tall, slender building built as an antenna mast four-tenths of a mile high! One antenna entered in the contest was 600 feet high, and covered hundreds of acres of French countryside. George Southworth, a radio pioneer, wrote about a proposed "super antenna." This antenna, never completed, was to cover an area of 50 square miles, but

the stock market crash of 1929 took away its funding. Such monster antennas are designed for the longer waves of the lower frequencies. Another example of this is the Project ELF antenna which used 56 miles of wire. Its function was to communicate with submerged submarines around the world.

One entry for the smallest antenna was the tiny metallic ring around a .25 inch diameter capsule carried by persons who are at risk of being kidnapped. When swallowed stomach juices activate the transmitter in the capsule, and it can be tracked from 3 - 5 miles away! That antenna is tiny, but workers at the National Institute of Standards and Technology developed an antenna about the size of a grain of sand. This antenna was designed to receive infrared light waves. (Light waves are electromagnetic waves just as radio waves are.)

### And So:

For all the interesting entries in the contest I want to say "thanks." I'm sorry we couldn't report them all, but I do appreciate each one.



## RADIO RIDDLES

### Last Month:

Last month you were asked: "Is a single-turn loop antenna circularly polarized? Must an antenna be circular to provide circular polarization?"

The answers are "No," and "no." A single-turn loop gives linear polarization; its orientation (vertical, horizontal, or in between) is determined by where the feedpoint is on the loop. For example, let's say that the loop is in a vertical plane as a wheel on a bicycle is when the cycle is being ridden. If we feed the antenna at the bottom (like where the bike tire touches the ground) then it is horizontally polarized. If we feed it on the side halfway between bottom and top it is vertically polarized.

Antenna elements that produce circular polarization needn't be circular themselves. For instance, circular polarization can be produced by properly-phased crossed-dipole (turnstile) antennas.

### This Month:

There are many antenna designs, home-brewed and commercial, available to support our HF reception. Yet we sometimes hear that a simple antenna, such as a random-length wire, supports reception just as well on HF as do our best efforts at a complex home-brew skywire, or any of those expensive commercial antennas. Can this be so? What about at VHF, UHF and microwave frequencies?

You'll find an answer for this month's riddle, another interesting, antenna-related web site, and much more, in next month's issue of *Monitoring Times*. Til then Peace, DX, and 73.

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## Programming Help for Pocket Receivers

The crop of tiny handheld wide range receivers which cover from short-wave through the gigahertz range have caused quite a stir in the monitoring community. Although in most cases their performance is very good, they still do not equal a high quality tabletop communications receiver.

For flexibility and portability, these handheld wide band receivers are ideal. However, they all suffer from one intrinsic problem: operator control. For example, just take a look at the diminutive size of the Yaesu VR-500, the ICOM R10, or R2! Because these units fit into shirt pockets, control keys are kept to a minimum and require multifunction levels for each key. That is, each key does double or triple duty by using a 2<sup>nd</sup> level and/or Shift keys in conjunction with the function keys!

Although this key complexity is necessary to access all the receiver's functions, it can make operation a real test of our ability to memorize. (Something we really don't need as we get older!)

### ❖ Enter RT Systems

Listening around on the ham bands and reading the Internet sites for these three radios, one software manufacturer's name kept coming up – RT Systems. So I gave them a call and shortly received the two software packages they have developed: ADMS-3 and IC-R2/IC-R10 Version 2.

ADMS-3, Advanced Data Management System, is for the Yaesu VR500 and comes on a single 3.5 floppy disk. It allows you to program all the features and memories of your VR500 directly from your computer. Uploading frequencies is just a click away. And saving frequencies from your VR500 is just as easy.

### ❖ Installation and Connection

The floppy loaded in seconds without any problems on my Pentium 120 MHz machine. The VR-500 programming kit comes with a cable that connects to the computer's serial port and then to the earphone (yes, the earphone) jack of the VR500.

Figure 1 shows the main screen with the "Setting" command tab selected. From this screen all the mumbo-jumbo of key

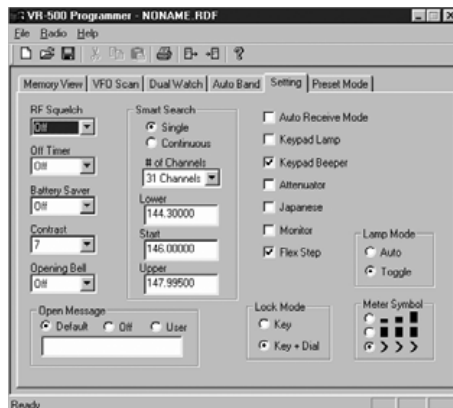


Figure 1: ADMS-3 Main Screen

pressing to achieve setting up the VR500 is just a click away. It's all here, from battery saver to squelch type and over twenty additional set-up commands. Even the type of "S" meter display can be chosen. This really makes using the VR500 a pleasure instead of an exercise in learning a whole new radio vocabulary.

Figure 2 shows the main screen of ADMS-3 in which the "Memory View" tab has been pushed. Notice the six menu tabs at the top of the box. Each of these brings up many more control functions. On the Memory View tab we can download the contents of the radio to the program with all of the channel details such as frequency, receive mode, name and preferential scan. Channels can be sorted and all types of data management such as frequency insertion, deletion, rearrangement, and bank linking

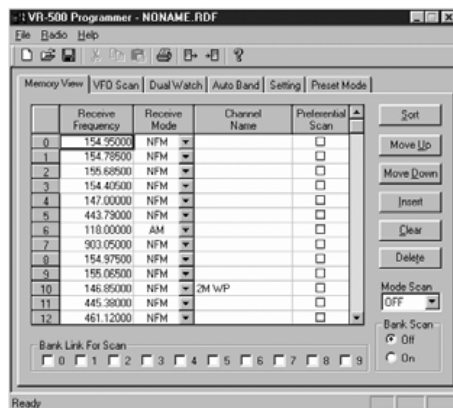


Figure 2: ADMS-3 Memory View

can be performed from this screen.

Can you imagine all the button pushing, function button holding and just plain brainpower it would take to perform these functions from the keyboard of the VR500? I shudder just to think of it!!

The VR500 has a great feature that allows the user to monitor two frequencies almost simultaneously. ADMS-3 has a Dual Watch Tab (third from left), which I found very useful and easy to use when trying to find optimum listening frequencies for a shortwave broadcast station.

### ❖ Comments of the Reviewer

For what it's worth, I just did not use my VR500 after I bought it, due to the complexity of its operation. But now ADMS-3 has changed all that and I love using the VR500. This software makes memory manipulation between the radio and computer files a snap.

### ❖ RT Systems ICOM Programs

RT Systems also devised software for the diminutive Icom radios. No fancy names here: only ICOM IC-R2 and IC-R10 Version 2. Both the R2 and R10 programs come on one 3.5 inch floppy.

Personally, I never had too much trouble controlling the R10 with its enlarged keyboard, relative to the R2. But, it was never a real pleasure to remember all the functional keystrokes.

RT Systems' IC-R10 version 2's main screen is shown in Figure 3. This is the set-up screen for the R10. Everything you need to customize your R10 is available from this screen. Each of the top dropdown commands brings up a whole host of easy-to-use features.

This main screen lets you control all the most used functions such as AFC, NB, Keystroke Beep (on/off) and Key Lock. However, I found that memory bank features, which I rarely used from the radio's keyboard, became easy to use when using this software.

Once again, as with the VR-500 software, copying and filing stored radio memories to a computer file required just two mouse clicks! It worked fast and without a glitch every time. Loading memory files from the computer into the R10 was just as simple

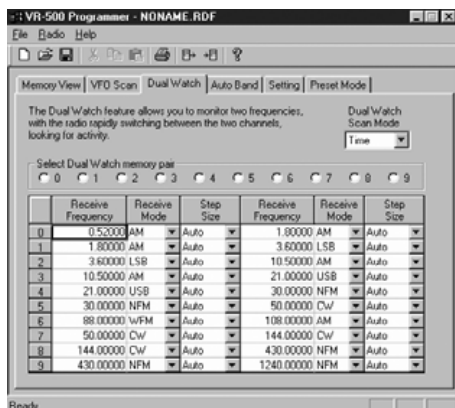


Figure 3: IC-R10 Version 2's Main Screen and reliable.

The View Memory function, Figure 4, gives the user a concise listing of all memory banks indicating bank number, frequency, mode and user labels. Editing of any of the data, including removal and moving to new memory location, is easily performed from this pull down menu.

### ◆ Taming the Dreaded R2!

If you look on Ebay at any time you are likely to find a few R2s for sale. Why? Many people find the lack of a keyboard a real problem. The R2 relies heavily on using

combination of scrolling functions, displayed on the LCD. Therefore, the small number of controls has many different uses depending on what command is displayed. It takes a while to get proficient in R2 operation. Still worse for me is moving between radios. Relearning the R2 operational "language" is required if you don't use the radio often.

RT System's R2 program makes all the problems disappear. Screen configuration and overall operation is similar to the R10 software and works just as well. Memory manipulation and transfer is again simple and reliable and all commands are available via dropdown menus.

Although I found RT System's screens intuitive to navigate, all have comprehensive Help files, which can be accessed from the Command line.

### ◆ Summary

There are a number of control programs from other manufacturers, including the receiver manufacturers themselves. Overall, I found RT Systems to rate as one of the best.

RT System's VR-500 programming kit comes with software and a cable. This cable connects the VR-500's earphone jack to your computer's 9 pin serial port. This same cable

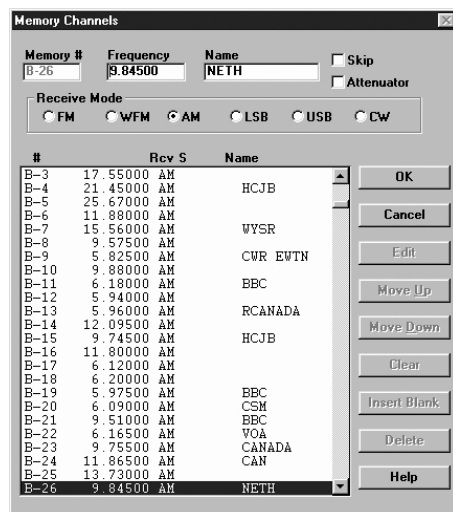


Figure 4: IC-R10 View Memory Screen

can be used for the IC-R2 and IC-R10. The price of the programming kit is a reasonable \$39!

The WCS IC-R2/R10 is the product you'll need for your ICOM handhelds. RT also has upgrade kits available. Check RT Systems website at <http://www.cloningsoftware.com> for the latest pricing and product information.



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## SWLing “on the go”

*Editor's note: this is the first in a series of articles on solutions to mobile SWLing.*

**P**ortable shortwave receivers were developed to address the needs and desires of shortwave listeners (SWLs) who dreamed of pursuing their hobby without being tied down to their boat-anchor receivers back in their listening shack. The idea of SWLing *while in transit*, however, has rarely been addressed. As we will see, SWLing while driving in an automobile, is do-able – but with a few caveats.

My fascination with mobile SWLing peaked after I purchased a Sony ICF-2010, one of the most revered, well known, and long-lived portable shortwave receivers ever committed to a circuit board. Having used it frequently while traveling, I was thrilled to be able to listen to my favorite SW broadcasts while away from home and my usual SWL equipment. Naturally, I began to wonder about the possibility of using the receiver during those endless hours of tedium while traveling to and from my destination. Surely, there must be a way to do it, I thought.

### ❖ Alternatives . . .

As nothing focuses the mind like an experiment, I tossed the portable receiver in my lap, stuck the whip antenna out the window of the car, and turned up the volume! Not surprisingly, I was disappointed; most portable SW receivers lack sufficient audio output to be heard above the din of wind noise coming through the window, the wind is constantly trying to push the antenna back into the window/door frame, and most of the antenna is shielded by the car's bodywork, save for the last few inches, resulting in woefully inadequate if nonexistent signal strength. Having my favorite portable SW receiver bouncing around on my lap while trying to drive didn't exactly inspire much confidence that this was the right approach, either. Clearly, successful mobile SWLing would require a more carefully thought-out solution.

Other alternatives included purchasing a dedicated AM/FM/SW in-dash car stereo, or an outboard SW converter used with existing AM/FM car stereo. Either alternative would require the investment of additional money in hardware that could not be used elsewhere, which seemed silly when I already owned a very capable portable SW receiver. Furthermore, choices in dedicated AM/FM/SW car

stereo units are very limited, as were the frequency ranges covered by most of them.

Frequency converters, while cheaper than dedicated car stereo units with SW capability, also suffered from a lack of spectrum coverage, typically covering only the most popular European SW bands. The most cost-effective solution would clearly involve adapting a preexisting portable SW receiver to the mobile reception environment.

### ❖ Identifying and Solving the Issues . .

Back at the drawing board, I began to list the issues that needed to be resolved to achieve mobile SWLing with a portable SW radio:

- **securing the portable radio while in the car, while still making it easy to install/remove**
- **getting adequate audio volume to overcome the “noise floor” of the automotive environment**
- **getting a decent signal to the radio, without mounting a 50-ft mast on the back of the car**
- **providing appropriate external power, to avoid running the radio off its internal batteries.**

Securing the radio was a simple affair, thanks to the fact that my car featured a flat, empty area on the passenger-side dash board that would fit the ICF-2010. Two long strips of heavy-duty Velcro® tape provided for both quick installa-

tion and removal of the receiver at a stable, convenient location.

Obtaining adequate audio volume to provide comfortable listening levels over the “noise floor” created by the tire noise, the engine/exhaust sounds, and incessant wind noise around the car, turned out to be almost as simple and cost effective as securing the radio was. The recent craze of portable CD players has resulted in a glut of adapters that plug into a CD player's 1/8" stereo phono plug socket on one end, while the other end slides into the car stereo's cassette player, just like an ordinary cassette tape. Since the ICF-2010 (and most portable SW receivers) has the same headphone jack, it can also be connected to your existing car stereo cassette player via this inexpensive and widely available adapter.

Instantly, the audio output of the portable SW receiver was transformed from a fractional-watt output through a tiny built-in speaker, to that of a lush, low-distortion, tone-controllable, 4-speaker, 10+ watts/channel wall of sound. The output rivaled, if not surpassed, the audio output quality of even expensive, full-size SW receivers.

Getting an adequate signal to the radio was a bigger challenge. Obviously, an outboard antenna was required, but it was unclear what would work best. Most of the literature on mobile shortwave work is written specifically for hams working HF bands from their cars, and as such does not address the broadband coverage in which SWLs are interested.

As a starting point, I simply took the existing base-loaded CB antenna on the vehicle and plugged that into the SW receiver. Surprisingly, the arrangement worked! BBC, Deutsche Welle, Radio Australia, and their brethren could be heard, but there was a down side: the further removed from the CB band a station was, the weaker the signal. Signals from roughly 15 MHz up were weak, but detectable, but below that frequency things seemed to deteriorate, especially on the nighttime bands. Worse still was the frequent overloading of the receiver with “Comin' back at ya, good buddy . . .” CB traffic from passing vehicles, even when the receiver was tuned to a different band. As a proof-of-concept, the loaded CB antenna was adequate, but definitely not suitable as a permanent solution.

I next decided to try a longer,



*A “before” photo of the empty dashboard, showing the Velcro strips used to mount the SWL portable radio*



helically wound mobile ham HF antenna, choosing a model designed for an HF ham band that was more toward the center of the commonly used SWL bands (roughly 5-25 MHz). The performance on the lower end of the SWL range would likely be better than a short CB antenna optimized at 27 MHz, while simultaneously reducing the CB "good buddy" interference/overload encountered with the loaded CB whip.

I mated the antenna, with its standard 3/8" x 24 thread, to an old trunk-mount antenna bracket laying around my parts bin, using a "quick disconnect" adapter to facilitate rapid conversion of the vehicle from its "ears up" SWL mode to a more sedate "stealth" mode. While overall performance was improved by using the mobile ham HF antenna, signal strengths were still not up to a level that assured a steady, clear audio output, and were inadequate to lock up the Sony's renowned synchronous detector.

In search of more signal "gain," I installed a Grove "Power Antenna III" preamp between the antenna and the receiver. The preamp, with up to 30 dB of gain, worked too well, inducing the Sony ICF-2010 to exhibit its unfortunate tendency to suffer from "intermodulation distortion" products. Thankfully, a quick and effective solution was available, the intermod problem being common when trying to run a portable SW receiver on a large outdoor long wire antenna such as I typically use.

Grove's MiniTuner (tun3), a passive tunable filter network, when installed in-line (serially) with the preamp, was just what the doctor ordered, attenuating strong signals outside the frequency range to which the radio was tuned, thus reducing or eliminating intermodulation products. A couple more strips of heavy-duty Velcro tape assured quick mounting/removal of the preamp and minituner to/from the top of the ICF-2010's chassis. Later, at Bob Grove's suggestion, I swapped the mobile ham HF antenna for a full-size 108" CB whip, in the hope that size (capture area) of the antenna would be more important than resonant frequency.

Powering the radio with an external power source (so not to wear out the internal batteries) was not a trivial problem, as the ICF-2010 requires +4.5vdc, and most cars are +12vdc. Interestingly enough, the Grove preamp ran off +12vdc car voltage, so I decided to fabricate a simple dc voltage converter and install it inside the preamp housing. I used a reverse-biased Zener diode of the closest voltage rating to +4.5v I could find, mounting the circuit in a vacant area of the preamp's case using silicone RTV rubber adhesive. The voltage converter tapped into the +12vdc supply coming into the preamp, and the output was sent via a power cord passing through a small hole drilled in the back of the preamp housing, carrying +4.5vdc to the ICF-2010 by way of an appropriate "barrel plug" power connector that matched to the radio's external power socket. Now, all the major hurdles to mobile

SWLing had been overcome.

#### ♦ A road trip to find out how it works . .

With my mobile SWLing system safely Velcroed in place, I gave it the acid test during several extended road trips, in both daylight and nighttime conditions. After dozens of hours of using the mobile SWL system, the results were in. Mobile SWLing was a "mixed bag":

The combination of audio noise (tire, engine/exhaust, and wind noise) and broadband RF noise produced by the vehicle (ignition, alternator, onboard computers) results in an insurmountable "noise floor" that makes listening to any-



An "after" photo of the SWL equipment installed in the car

thing other than powerhouse international SW broadcasters with blowtorch transmitters almost impossible. Mobile operation and SW DXing just do not mix. (And headphones are dangerous, if not illegal, while driving.)

Accessory devices (heater fans, wiper motors) can produce almost as much RF noise as the ignition system, alternator, and onboard computers, further spoiling moderate or weak-signal listening pleasure while mobile.

Few major SW broadcasters put out a usable signal to the Northeast US during midday hours, with a greater selection of European broadcasters available in the evening or nighttime hours on the East Coast. Radio Australia can also be

heard early in the morning, up to about 9 a.m. local time.

Electrically short antennae produce low signal levels and are more prone to signal fade than long wires; the ICF-2010's synchronous detector was a major asset in reducing flutter and phase distortion (associated with selective sideband fading). Any receiver to be used for serious mobile SWLing would benefit from this feature.

If your favorite International SW broadcaster puts out a blockbuster signal on your home listening setup, it should be audible via mobile SWLing at that same time of day, with a setup similar to the one described in this article. If you are hunting for "Radio Kiribati" or similar exotic DX targets, you can forget it.

#### ♦ For the future . . .

Really quiet, well-insulated cars, with proper shielding of ignition, charging system, and onboard computers, might make moderate/weak signal SWLing a more practical reality. A receiver with a noise blanker circuit might help suppress pulse-type RF noise, and a DSP audio processor might improve the signal to noise ratio. RF noise cancellation devices might also be useful in reducing RF noise coming from the vehicle. Barring a miraculous breakthrough by any of the above, we will accept the inherent limitations of mobile SWLing, and be content with the few powerhouse international SW broadcasters that bathe us with strong signals.

#### About the author . . .

The author is a longtime radio enthusiast, dating from his childhood fascination with depression-era tube SW receivers, such as the GE model 62. He currently has an assortment of more modern equipment running off a 200'+ long wire antenna, including a Japan Radio NRD-525 for home SWLing and LW/MW DXing, a Sony SW-1 ultra-mini SW receiver for travel, several scanners, and a collection of dead electronic devices patiently awaiting resurrection.

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## Optoelectronics DS1000 Counter

**T**hough I've been blessed with the normal senses of vision, hearing, smell, and touch, I find these senses limiting. Technology helps me extend them. For example, I built an ultrasonic receiver from an old *Popular Electronics* article so I could hear sounds above the frequency limit of human hearing. Fisher and Garrett brand metal detectors let me find interesting objects buried below ground, otherwise hidden from sight. A telescope, microscope, and binoculars permit me to see what I cannot ordinarily see.

to monitor analog FM signals because my receivers cannot demodulate digital signals.

### Counter Features

Six large pushbuttons control the DS1000's modes and parameters. Frequency coverage is divided between two bands: 10 - 500 and 500 - 2600 MHz. The frequency resolution may be set to 1 kHz or 100 Hz. That's coarser than a general purpose frequency counter but is appropriate for radio surveillance work.

### Surveillance Features

The DS1000 can "Reaction Tune" a C15 compatible receiver to the displayed frequency when connected by the proper cable (not supplied). Optoelectronics can supply the Reaction Tune cables for the ICOM IC-R10, R7000, R7100, R8500, R9000, AOR AR8000, AR8200, Uniden BC245XLT, BC780XLT, and Optoelectronics R11. OS456 and OS535 equipped Radio Shack models may also be tuned.

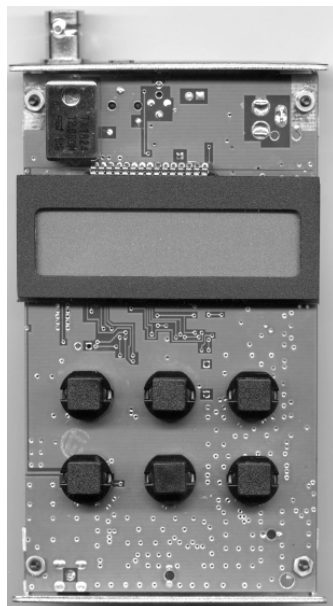
You can leave the DS1000 hidden in a knapsack for a few hours while it records RF activity in the 10 - 500 or 500 - 2600 MHz ranges. The DS1000 can remember up to 1000 unique frequencies on which it detects signals. Each of the 1000 memory channels has an associated "hit counter," which is incremented each time the DS1000 detects a signal on that particular frequency.

Software supplied with the DS1000 permits you to copy the frequencies from the counter to your PC and place them into an ASCII text file. The software runs under Microsoft DOS or in a DOS window under Windows 95 or 98. Optoelectronics includes the software and serial cable as standard equipment. I installed the software but did not get the opportunity to test it due to a problem that developed in the DS1000 (see below).

A signal strength bargraph display lets you use the DS1000 for direction finding when connected to a directional antenna resonant near the desired frequency.

### Powering the Counter

The DS1000 is powered by an internal NiCd battery pack. The counter may be powered from an external 9 to 12 VDC source and Optoelectronics includes a 9 VDC (nominal) 500 mA wall wart supply for this purpose. The external power source also charges the internal NiCd batteries. The user manual doesn't specify how long it takes to charge the batteries or whether applying external power continuously will overcharge the batteries. The DS1000 should not be connected directly to your car's electrical system, which can produce voltages exceeding 12 VDC and damage the counter.



*Optoelectronics DS1000, inside front view, DS1000 inside rear view.*

I want to extend my senses into the RF world, too – to be able to "see" the radiation pattern of transmitting antennas as they emit radio signals into the air. Perhaps someday we'll be able to buy inexpensive, RF sensitive photographic film or "RF-sensitive" eyeglasses which will permit us to view RF. Until then, I've been using scanners, spectrum analyzers, and frequency counters to explore the RF environment.

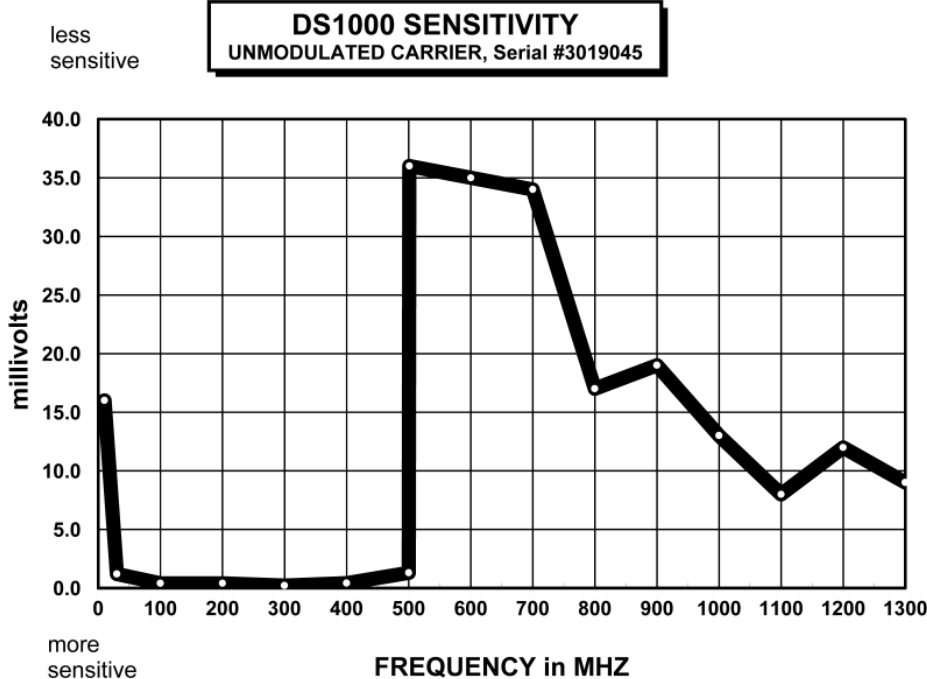
The new Optoelectronics DS1000 is a handheld frequency counter with additional features that make it useful in radio surveillance work. In addition to detecting analog RF signals, Optoelectronics says it can detect digital signals if the pulse width is greater than 500 microseconds, including APCO 25, TDMA and GSM (cellular phones), and TETRAPOL. I am using the DS1000

A 12 MHz TCXO (temperature compensated crystal oscillator) is used for a time base. The stability is cited as 0.5 ppm (parts per million), though no temperature range is mentioned. TCXO technology is well suited to a handheld counter. It is more stable than a simple, uncompensated oscillator found in the cheapest counters. An ovenized oscillator could be more stable, but requires significant warm-up time and would draw plenty of current from the battery pack.

The DS1000 displays signal strength, calibrated from -5 to -45 dBm – a feature not provided by most frequency counters.

Optoelectronics supplies a 16" telescoping antenna with each DS1000 and recommends it for use in the 10 - 600 MHz frequency range. The LCD display is illuminated for night viewing, though the lighting can be disabled.





## Performance

Optoelectronics rates the DS1000 sensitivity as less than 5 mV (millivolt) between 27 and 2600 MHz, and less than 30 mV at 10 MHz.

Tests below 1300 MHz using a lab signal generator show this counter's (s/n 3019045) sensitivity to unmodulated RF carriers (see graph).

The DS1000 faithfully displays the 49.83 MHz FM signal emitted by a low power Fisher-Price baby monitor transmitter, though the counter's antenna must be located within an inch.

My old Raynor DT garage door opener transmitter is made by Linear Electronics. A spectrum analyzer shows the opener's digital signal is rather wide and centered near 310.044 MHz.

None of my frequency counters, including the DS1000, is able to display a stable reading.

When the DS1000 finds a signal, it becomes slow to respond to keypresses, and sometimes ignores them completely. I can't turn it off when the problem appears because the power switch is implemented as a

## Glitch

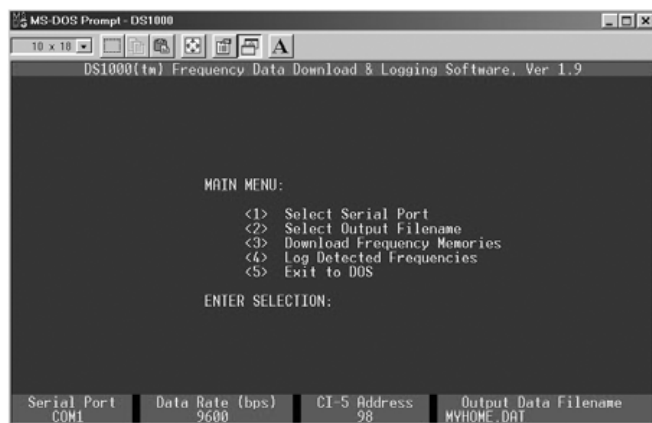
The DS1000 provided to me has an intermittent problem: it becomes slow to respond to keypresses, and sometimes ignores them completely. I can't turn it off when the problem appears because the power switch is implemented as a

"soft" key. Optoelectronics says this is an uncommon problem.

For more information about the DS1000, contact Optoelectronics, 5821 NE 14th Ave., Ft. Lauderdale, FL 33334, email [sales@optoelectronics.com](mailto:sales@optoelectronics.com), web page <http://www.optoelectronics.com>.

## Software for the Yaesu VR-120

Gommert Buysen of BuTel Software tells us that BuTel is developing new PC software to program the Yaesu VR-120 (July 2001 MT). We reviewed BuTel's excellent ARC2 software for programming the ICOM IC-R2 (January 2001 MT). For more information, see the web site at <http://www.butel.nl>.



DS1000 software main screen.

The counter is slightly less sensitive to test signals modulated with a 1 kHz tone at 3 kHz deviation. The DS1000 can measure signal strength in dBm and its readings agree to within approximately 6 dB with our measurements.

A simple bench test cannot simulate a "hot" environment, filled with several signals on different frequencies and employing different modulation schemes. Therefore, I enjoyed experimenting with the DS1000 outdoors. The counter locks on signals from a 146 MHz walkie-talkie up to 75 feet away. By shortening the telescoping antenna to a single section, I am able to read 446 MHz signals from a walkie-talkie up to 50 feet away.

**NOTICE:** It is unlawful to buy cellular-capable scanners in the United States made after 1993, or modified for cellular coverage, unless you are an authorized government agency, cellular service provider, or engineering/service company engaged in cellular technology.

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## Midland's G-30 GMRS Radio

One of the things about being a full-time professional writer is that you get into the "habit of curiosity." You find yourself asking questions about almost everything.

Recently, the New York State Legislature passed a law making it illegal to operate an automobile while talking on a cellular phone – unless you have a headset or hands-free option. This got me to looking around and really taking note of how many drivers are talking on the phone as they navigate the highway, and there are a lot of them.

Since I am also a regular columnist for *Your Favorite Radio Magazine*, this led to another bit of curiosity: If cell phones are so darn popular, how come FRS and GMRS radios are also selling like hot cakes? Aren't they both personal, portable communication devices?

The conclusion I came to is that, in many cases, good old simplex communications between handtalkies is simply the right solution. This summer, our family visited an amusement park, and I was amazed at the number of people I saw with FRS and GMRS radios clipped to various parts of their anatomy. Some also had cell phones, but for staying in touch at short range, quickly, easily, and simply, FRS and GMRS radios are hard to beat.

The Midland G-30 GMRS radio is such a handy communications device. Weighing about 7.5 ounces with batteries and measuring approximately 4.5 inches by 2.25 inches by 1.25 inches (excluding antenna and belt clip), the G-30 offers a full two-watts of *simplex-only* (no GMRS repeater capability) communications power on 15 channels:

462.5625	462.5750
462.5875	462.6250
462.6125	462.6750
462.6375	462.5500
462.6625	462.6000
462.6875	462.6500
462.7125	462.7000
	462.7250

The first 7 channels are shared with the Family Radio Service, but the last 8 channels are General Mobile Radio Service only. The second page of the manual says "The Midland model G30 radio operates on GMRS frequencies, which require a license from the Federal Communications Commission (FCC)." It then goes on to tell how to contact the FCC for licensing

forms and information.

On the same page, there is a warning – not about the need for a license – but **DO NOT TRANSMIT WHILE USING THE BELT CLIP**. That's to maintain compliance with the FCC's RF exposure guidelines. I appreciate the safety warning, but I think a little greater emphasis on the need for a license would have been a good idea as well.

The G-30 is good looking. The case, antenna, and all but one of the buttons are black, highlighted with white lettering. On the front of the handtalkie is a speaker grill, a pair of black

UP/DOWN buttons, three additional black buttons (marked F, M, and E), and a translucent white PWR button that has green and red light-emitting diodes beneath it. The F button is for selecting various functions; the M button, for monitoring by defeating the auto-squelch, and the E button is for entering various operating options. Just beneath the speaker grill is a small liquid crystal display panel for showing channel and CTCSS (continuous tone-coded squelch) code number. Beneath the F, M, and E buttons is a tiny opening for the microphone.

On the top of the case, there is a study flexible rubber antenna (which is removable) and a jack, covered by rubber plug, for a speaker/microphone. On the left side of the case, you'll find the push-to-talk button. On the back of the case, there is a removable belt clip with wrist strap and two contacts for use with the drop-in charger. On the bottom of the case is a hatch for installing the battery pack.

One of the very nice things about the G-30 is that it comes complete with a rechargeable battery pack and a drop-in quick charger. It takes about 1.5 hours to charge batteries for about 9-10 hours of operation. The drop-in charger, which is powered by a wall-wart transformer,

also has a slot for recharging an additional battery pack if you have one (only one is included standard with the radio). I give Midland full marks for thinking it through: with this set up, you can charge both the radio and a spare battery pack and be ready to go for about 20 hours of operation.

### Field Test

Operating the G-30 is straightforward. Press the PWR button for two seconds and it turns on. When the radio is transmitting the PWR button glows red; when receiving, it glows green.

The UP/DOWN buttons normally increase or decrease the audio volume. But press the F button once, and the UP/DOWN buttons change channels; press F twice, and you can select a CTCSS code to block reception of unwanted transmissions. Press F three times, and you can activate scanning; four times for Priority Channel scan, and five or six times (depending on previous settings) to lock all but the PTT button. I particularly like the fact that you can't inadvertently change channels without first pressing the F button.

Unfortunately, the performance of the G-30 does not match its otherwise commendable qualities. In tests with two pairs of G-30s over my standard test course, I found that the G-30 offered no greater range than a top-performing FRS radio. I

suspect that this radio would benefit greatly from a somewhat longer antenna. Audio, however, when the radios were within range of each other, was crisp, clear, and very pleasant.

Suggested retail price of the G-30 is \$179.99 but street price, according to Midland, is likely to be in the \$110-\$130 range. For more information about Midland Consumer Radio and its products, visit <http://www.midlandradio.com> or call 1-816-241-8500.



# The Spectrum Analyzer as a Receiver

By Bob Grove

Those of us who hunger for gadgets occasionally come across equipment intended for another use and wonder whether it would work for our applications. Such a device is the spectrum analyzer, a highly-useful instrument for the electronics professional.

Spectrum analyzers paint a visual display of busy frequencies across their screens. Some even have audio recovery so that modulated signals can be monitored audibly as well as detected and measured visually.

But how do spectrum analyzers compare with dedicated communications receiver and scanners? After all, spectrum analyzers are considerably more expensive, so shouldn't they work just as well for listening?

The short answer is no. Spectrum analyzers do have receivers in them as a primary subsystem, but their performance falls far short of that of communications receivers and even inexpensive scanners in terms of signal reception. Let's see why.

## The Blonder Tongue BTSA-8558C

As a case in point, let's examine the specifications and performance of a very nice, low-cost spectrum analyzer, the BTSA-8558C, manufactured by a noted TV test equipment company, Blonder Tongue Laboratories.

Intended for benchtop, mobile, and field applications, the 8558C is loaded with features. Its slim profile (10-1/2"W x 3"H x 16"D), unusually-light weight (9-1/2 lb. including battery), and universal power supply (AC, 12 VDC, and internal batteries) invite portability.

A bright, green-trace, 3" CRT displays signals visually; a smoke-grey dust cover may be left over the face plate for dust and impact protection, or hinged upward for access to the controls. A small, thermostatically-controlled fan automatically cools internal temperatures.

The 8558C has a continuous frequency range of 100 kHz-1020 MHz; demodulates AM and FM signals so that they can be monitored with its internal speaker; incorporates several selectivity bandwidths; may be set to display as much as the entire 1000 MHz at one time or just a few kHz; has a 4-digit frequency display; and can be powered by AC, DC, or its own internal battery for nearly an hour.

The spectrum analyzer comes with an AC adaptor/charger, light shield for the CRT screen, canvas carrying back, BNC adaptors, and a protective transparent panel cover. Available op-

tions include a noise generator, interchangeable power pack, audio/video generator, reflectometer bridge, and cigarette-lighter power adaptor.

But we must not lose focus on the fact that this is not a communications receiver; it is a test instrument designed for specific applications, not for listening to signals. For serious sleuthing for elusive, weak communications signals, or continuous monitoring of their modulated contents, a low-cost spectrum analyzer just won't hack it.

Blonder Tongue lists several recommended applications in the instruction manual: RF product design and production testing, signal analysis, interference compliance and detection, technical measurements in the broadcasting industry, and security/surveillance. And for these applications, the 8558C works well.

But as a receiver, we need to examine the specs a little closer.



## On the Receiving End

First of all, sensitivity is not near that of a communications receiver or scanner; while we can add a preamplifier to boost the sensitivity, the 8558C has a third-order intermodulation figure of only -65 dB, promoting strong-signal overload in a busy RF environment. In the absence of automatic gain control (AGC), a manual, 8-position attenuator is adjusted, as is a three-position toggle switch for both the display and recovered audio.

While the 8558C has a digital frequency readout, its best resolution is a wide 100 kHz; and because of its voltage-controlled oscillator system, the readout is not accurate and the signal drifts. This is acceptable for wideband video and aural broadcasting signals, but voice communications bandwidths are ten times narrower. No SSB mode is provided, but the drift would make sideband detection intolerable.

Selectivity of the 8558C may be set as 30, 300, and 3000 kHz (that's 3 MHz!); VHF/UHF

voice channels are typically spaced 12.5-15 kHz or even closer. With communications receivers boasting voice/data filter selectivities of 3-15 kHz, and filter shape factors of a sharp 2:1 or 3:1, the 8558C's 14:1 means that if two or more adjacent signals transmit simultaneously, the strongest signal wins; the others are covered up.

Audio is derived by slope detection; this means that AM signals come in well, but FM is distorted, requiring off-center tuning which reduces sensitivity further. And you can't sweep visually and monitor aurally at the same time. The procedure is to tune through the panorama of frequencies on the screen, centering an interesting signal spike, then stepping the span switch down to "0" which engages the audio recovery, but deactivates the sweep.

But there is considerable response lag between switching the span switch from visual sweep to audio recovery – some 4-5 seconds, then more lag between the turning of the tuning knobs and the response of the circuitry – another two or three seconds, imbuing a "rubbery" feel to the fine tuning procedure.

A one-inch tuning knob traverses the entire 1 GHz of spectrum in just eight turns; a separate fine-tuning knob permits touching up after the coarse frequency is set.

## The Bottom Line

Next to multimeters and oscilloscopes, spectrum analyzers are the most versatile pieces of test equipment at the technician's disposal. But they are test instruments, not communications receivers or scanners. Provided you know how to use them, they are invaluable for tuning up receivers and transmitters, making antenna adjustments, trouble-shooting defective equipment, aligning satellite systems, and technical surveillance countermeasures (TSCM), the professional term for "debugging" or "sweeping" for surreptitious listening devices.

If a radio transmitter is operating anywhere in the frequency range that the spectrum analyzer is capable of tuning, it can be found in a snap. Even spectrum-hopping and spread spectrum can be seen on the scope when properly adjusted. And for determining the presence of unknown agencies, licensees, or non-licensees on the air, a spectrum analyzer can't be beat.

The versatile BTSA 8558C lists at only \$3295 and is available from Grove Enterprises (7540 Highway 64 West, Brasstown, NC 28902; 800-438-8155 or [order@grove-ent.com](mailto:order@grove-ent.com)).

# What's NEW

Tell them you saw it in *Monitoring Times*

## The Spydercone Antenna System

Nothing is more important for a radio station than the antenna. When an antenna is designed for both reception and transmission, the parameters needed for transmission may restrict what's optimum for the antenna's reception duty. However, the Spydercone antenna by Genesis High Frequency was designed to benefit shortwave listeners and DXers every bit as much as ham operators. Plus, this omnidirectional antenna's unique design results in a large capture area without using a lot of real estate.

The antenna has four legs, each nearly 51 feet long. One half the feed line feeds one set of two legs and the other half of the feed line feeds the remaining set of two legs. The feed point is encased in a molded form made of resin. This insures weatherproofing for all solder joints and great tension strength at the feed point. The hand molded feed point has an outdoor life expectancy of over 100 years!

Hanging hardware is stainless steel. The legs are made using Wireman's best antenna wire, Toughcoat 'Silky' 13 AWG, 19 strand copper-clad steel with a tough, high density, low-gloss poly-

ethylene jacket. The feed line is 450 ohm, 16 AWG, 19 strand copper-clad steel conductors, poly-clad ladder line, which is flexible, easy to use, and handles high power. The insulators are Budwig's Brand HQ-2 fiberglass reinforced ABS Plastic.

"The Spydercone has been tested on all HF bands with outstanding results!" says owner James Reynolds, K16UP. "However, as an added bonus, it also tunes and performs beautifully on VHF and UHF as well, offering multiple wavelengths." He claims that the Spydercone occupies ground space less than a 40-meter horizontal dipole but has over 4 times the conductive area in the air!



Pricing varies according to model and length of feed line from \$119.99 to \$200 and up. Since the feed line forms part of the antenna, it must be ordered in the proper length for your installation, and not cut or coiled. Deluxe models include heavier gauge wire, lightning arrestor, and broadband kit. For more specs and information, visit James and Janice on line at [http://](http://www.coneantenna.com)

[www.coneantenna.com](http://www.coneantenna.com) or call them at 850-722-7959 (toll free order line 877-890-CONE (2663))

## Electro-Magnetic Radiation Detector

Grove Enterprises is carrying a new tiny, pocket accessory ideal for detecting the presence of radio and electric fields in your proximity. With a continuous frequency response from 50 Hz to above 1 GHz, and an average sensitivity of 25 uV/cm, this new EMR Detector from WiNRADiO is a very handy gadget.

Switch between high and low sensitivity for determining the presence of strong or weak radio signals, power line radiation, microwave oven leakage, stray radiation from electrical and electronic appliances, stray signals from computers, cellular and cordless phones, and even detect hidden transmitters.

A bright LED combines with an audible tone to alert you to the presence of radiation; as you approach the source, the LED glows brighter and the tone rises, letting you home in on the offending device. Requires two 12-volt mini batteries, readily available from chain stores.

The EMR Detector is \$49.95 plus shipping from Grove Enterprises (7540 Highway 64 West, Brasstown, NC 28902). Call 800-



438-8155 or email [order@grove-ent.com](mailto:order@grove-ent.com) and ask for their catalog item TST06.

## Grove Federal Frequency Directory

Readers who follow Larry Van Horn's Fed File column in *Monitoring Times* have been eagerly waiting for this one! This is the CD-ROM that puts all Larry's painstaking research into federal frequency allocations (published every month in "Table One" since December 1998) into one database.

This is the most complete and accurate list of government agencies from 30-420 MHz available to the public from unclassified sources – over 3500 discrete frequency entries! As a bonus, the CD also includes the latest edition of the National Telecommunications and Information Administration (NTIA) Red Book and the official NTIA color chart of the radio spectrum!

The Cone Antenna's feed point is 37 to 47 feet above ground. End of wires between 14 to 18 feet above ground. Distance between ends of each set of wires is 29 feet. The two sets of wires are opposite directions from each other. The Antenna can be hung from a tree, a pole or a tower. The more "in the clear" the better.

Broad Band kit fills the gap between the insulators and makes the antenna look like two sloping deltas! (Advanced and Deluxe Models)

End of Wire - 18ft Above the Ground

Feed line lengths are CRITICAL - Do not Coil extra line nor CUT it. run at angles away from Mast.

Feed Point 37 - 47 feet Above Earth

All measurements are optimum and not critical. "best Case" shown



The Grove Federal Frequency Directory is organized in frequency order and is presented in searchable



# What's NEW

Tell them you saw it in *Monitoring Times*

Adobe Acrobat (provided on disk) PDF format. The CD (order code SFT32) is \$39.95 plus shipping from Grove Enterprises (800-438-8155 or <http://www.grove-ent.com>)

## Sangean 505 in a new package

Sangean's popular 505 portable shortwave receiver is receiving new, attractive packaging and being released as the 505P. The add-on antenna and AC adapter will also be included in the package, at the same price as the previous 505 model. This unit is now available from Grove for \$129.95 plus shipping. Order Grove catalog item RCV07.

## FCC Frequency Database on CD-ROM

With Percon no longer offering their Spectrum CD-ROM database of FCC license assignments, another company has produced a follow-on product – and it's Percon compatible, usable with previous Spectrum database software. Covering all 50 United States and possessions, and a frequency range of 0-25,000 MHz, the CD includes up to 26 data fields depending on the user supplied software with which it's used.

Services include public safety, state and local government, business, broadcasting, and more, but not NexTel 800 MHz digital systems. Initial sort is by state, county, city, and frequency. The fields include: Callsign, name, frequency, service, licensee, city, county, state, latitude/longitude, address, class, power, antenna/tower details, number of units, and license dates.

No search engine is included, so a dBase-compatible program must be provided by the user to read the files; dBase or Access for Windows 5.0 is recommended.

Cost for the raw database is

\$29.95 plus \$5.00 shipping. For more information or to order, contact the company by email at [mch@nb.net](mailto:mch@nb.net), <http://home.dencity.com/uss-voyager/FCCData/fccdata.html>

## Sounds Good

If it's Bose, you expect it to sound good – but did you ever expect a Bose to play streaming audio from the Internet? The latest innovation from Bose is the Wave/PC system, which includes software, a specially-adapted Bose Wave radio, 15-ft. cable, and a remote control. Hundreds of Internet stations are preselected by Bose for their quality sound, but you can add any of your own. You can compress your own CD library into your computer and mix them into your playlists. The system requires Windows 98 or later; Pentium II or equivalent; 32 MB RAM, 200MB free hard drive space, C-ROM drive, soundcard, available serial port, and Internet connection.



Cost is \$449 plus shipping. For more information, call 800-414-2073. For a taste of how it works, visit a dealer near you, or visit their website for a simple demo at <http://wavepc.bose.com/wpdm>

## Sounds Good in the Car

This month *MT* starts a series on listening to shortwave radio in your car. When you're trying to get the most out of your mobile audio system, don't forget one often-overlooked element in your system – the cables. Monster Cables has cables and amplifier hook-up kits that will minimize noise from poorly-designed ground cables. Monster power cables use high purity copper and special windings to reduce noise pick-up, maximize sound quality, and make installa-

tion easier with super flexibility. The Duraflex jacket enables the cable to withstand harsh conditions to keep performing year after year.

Look for Monster Cable brand products; call 415-840-2000 or visit <http://www.monstercable.com> to locate a store near you.

## More Electric Fuel Chargers

Electric Fuel Corporation has added several new models to their product lineup including a charger for Palm V handheld computers that delivers up to 8 full charges. Other new models include chargers for Compaq iPAQ Pocket PCs, Handspring Prism and Visor Phone models, and Novatel Minstrel V wireless modems, HP Jornada and Casio Cassiopeia models.

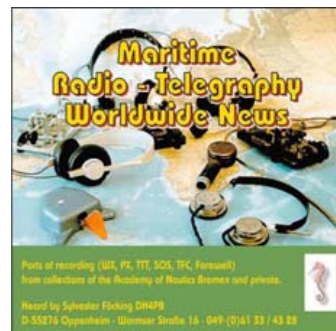
Instant Power Chargers allow users to power their PDAs without the need of an electrical outlet, which means you can keep working even if your battery goes dead. The pocket-sized charger weighs less than three ounces and plugs directly into the PDA, allowing it to be used anywhere an electrical outlet is not readily available.

A complete Instant Power charger kit, including reusable SmartCord, is priced at \$19.95 (MSRP); Instant Power Cartridges are priced at only \$9.95 (MSRP). More product and model information is available at the Company's website at <http://www.electric-fuel.com/InstantPowerCharger>.

Electric Fuel Corporation, with manufacturing and R&D facilities in Israel and Alabama, is a leader in primary and refuelable Zinc-Air fuel cell technology. Zinc Air fuel cells come fully charged and ready to use right out of the pack, provide consumers with up to five times more talk and stand-by time when compared with conventional batteries.

## Coastal Radio Recordings

If you miss the CW chatter of maritime radio, a former RO (radio operator) Sylvester Foecking, DH4PB, has put together a double CD with recordings of coastal radio



stations. TTT, DDD, SOS, WX messages, ice warnings, regular traffic etc. on 500kHz and some of the final farewell messages by stations like DAN, Y5M, FFB, GLD, VCS, ZLZ, WCC, NSS, GKA, EIM, VIX, WSL, IAR, VPT, 9VG and others. You'll hear SOS-, distress and security-messages, iceberg-warning, weather forecast and press releases and you'll see how Maritime radio telegraphy was done in practice. From what you hear you may guess what kind of ability was necessary for a radio operator and what a sensitive ear was needed to select the right information.

These recordings are from DH4PB's own archive and from the Nautical Academy Bremen. A portion of the proceeds goes to "Society of Radio Officers Bremen." You can sample some maritime communications in audio clips off his website at <http://www.seefunker.de> for a taste of what's on the CD.

To order the *Maritime Radio Telegraphy World Wide News* CD send payment to Sylvester Foecking, Wormser Strasse 16, D 55276 Oppenheim. The CD is \$7.50 Deutsche Mark, plus shipping (\$12 DEM to the U.S. and overseas; \$4 in Germany). For more information email [foecking@main-rhein.de](mailto:foecking@main-rhein.de)

Books and equipment for announcement or review should be sent to "What's New?" c/o *Monitoring Times*, P.O. Box 98, 7540 Highway 64 West, Brasstown, NC 28902. Press releases may be faxed to 828-837-2216 or emailed to [mteditor@grove-ent.com](mailto:mteditor@grove-ent.com).

## HERE'S WHAT OUR READERS ARE SAYING ABOUT MT EXPRESS:

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Keaau, Hawaii

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By Bob Grove,  
Publisher

## The Changing Complexion of Marketing

It's inevitable. With progress comes change, and many changes have come to the radio market.

I grew up in Cleveland, Ohio. After WWII, millions of tons of surplus electronics invaded the U.S., much of it inspiring entirely new industries like Heathkit, which introduced their original OS-1 oscilloscope kit using surplus parts.

During the '50s, electronics magazines bloomed with ads from companies that specialized in military surplus; short-wave receivers, transmitters, test equipment, and more could be had for a few dollars, while parts sold for pennies a pound.

Specialty electronics storefronts also catered to the homebrew enthusiast; some full-line dealers like Progress Radio and Pioneer Radio feted the aspiring ham with their array of new parts and equipment, while Western Salvage was the Mecca for stalwart experimenters who preferred surplus.

There were quite a few ambitious entrepreneurs who began marketing innovative products as well; I can recall the short-lived "Black Widow" ten- and six-meter transceivers being marketed by a small Cleveland shop. Other motivated mini-manufacturers dotted the country.

Because of this cornucopia of high quality electronics at giveaway prices, hams and SWLs alike built much of their own equipment, learning about electronics as they went, fascinated by the technology and the potential of working the world with a tiny investment.

By the '60s the surplus market was starting to run dry, and another influence was being felt: Japanese commercial equipment. Resistant at first, a few cautious customers began sampling these mass-produced radios with strange-sounding names and liked what they found.

But indomitable American retailers soon learned that they could profit as well reselling imported merchandise, and we soon saw the beginning of electronics chain stores like Lafayette Electronics out of Long Island, New York, and Olson Radio with their AKRAD brand out of Akron, Ohio.

Yet another battle loomed: the transition from "hollow state" vacuum tubes to "solid state" transistor technology...and its successor, the integrated circuit (IC).

By the '70s and '80s, enormous interest in consumer electronics provided a ready market for entrepreneurs. Hobby magazines were profuse, offering unlimited advertising opportunities.

But the abundance of consumer electronics had an anesthetic effect on the American population. Everywhere he looked, the consumer saw an electronic answer: telephones, automotive, home appliances, medicine, food preparation. The magic was gone.

To the rescue came a new wonder: the home computer. Formerly a high-tech industrial labor- and cost-saving device, the computer was put to task for a seemingly endless

variety of assignments, from word processing, to mathematical computation, to file storage, to games.

By the '90s, computers began to reign supreme in the esteem of techno-hobbyists, and radio began to be the former hobby.

And then the double-whammy: the Internet. Now electronics hobbyists could commune worldwide, exchange ideas, access previously-unavailable information—and all without static, unreliable propagation, unsightly antennas, or the need for a license exam.

And the marketeer? A new, unlimited opportunity to sell his wares. Where magazine ads could cost from a few dollars for a classified ad, to thousands of dollars for a display ad, anyone can create a web page that makes him look like IBM! And there's the rub.

While long-time, established companies with excellent reputations and established integrity have to maintain reasonable profit margins to remain in business; here at Grove Enterprises, our retail division, we have determined that if we can't make at least 15% markup on our products, there is no reason to carry them.

While 6%-10% dealer discounts, very common in our market, may make a good real estate commission on the sale of a house, it doesn't even cover overhead on a \$300 radio!

A good example of what I call predatory pricing practices is seen at many of the larger hamfests, where dealers compete to get customers. Recently, I wanted to buy a new ham rig, and as a dealer of that particular manufacturer, I approached the company to see how much I would have to pay for a \$1400 retail personal rig at their special, one-time, "employee's discount": It was over \$1000.

I waited for the hamfest. One chain-store dealer quoted \$869, another — from whom I purchased the rig — charged only \$819. I was astounded. Where does the profit come from? This is way below their cost.

And with on-line advertising, any opportunist with or without a day job can advertise products at alluring discounts, take trusting clients' money, then purchase just enough merchandise to satisfy the legal requirements. No customer service, no after-sale support, no one to contact with questions. You get what you pay for.

Worse, there are other, more nefarious individuals who advertise, take money, then disappear. Such criminal aspects of sham marketing cast a shadow on legitimate dealers, creating a general distrust among customers.

So how does the visitor to a web page know that this is a dealer who can be trusted? I'd like your comments on this, and we'll share them with other MT readers in a future installment.



# AOR AR8200 Mark II B & AR8600 Receivers

## Welcome to the Top Shelf



AOR wide-range communications receivers are designed and built for the serious user. Among our customers are governments and government agencies, news gathering operations, military units, laboratories, public safety operations and more. If you are a demanding user who expects the best, you're ready for AOR, The Serious Choice in Advanced Technology Receivers.™ Don't look for AOR on the bottom shelf at your local discount store, you won't find us there. For dealer locations, check our web site, [www.aorusa.com](http://www.aorusa.com)



**Technology so advanced,  
it's patented** (US Patent 6,002,924).

### AR8200 Mark II B

#### **Base performance in a hand-held receiver!**

- 530 KHz ~ 2040 MHz \* coverage
- 1,000 memory channels (20 banks) with alphanumeric labeling
- Computer control and programming (requires optional cable)
- Download free control software from AOR web site
- "All Mode" reception includes "super narrow" FM plus wide and narrow AM and USB, LSB, CW and standard AM and FM modes
- True carrier reinsertion in USB and LSB modes  
Includes 3 KHz SSB filter!
- Detachable MW antenna with negative feedback
- Optional internal slot cards expand capabilities. Choose from Memory Expansion (up to 4,000 memories), CTCSS Squelch & Search, Tone Eliminator, Voice Inverter\*\* and Record Audio (saves up to 20 seconds of audio)
- Tuning steps programmable in multiples of 50 Hz in all modes
- 8.33 KHz airband step is correctly supported
- Noise limiter and attenuator
- Lighted keys
- Band activity "scope" display with "save trace" capability
- Four-way side panel rocker switch allows one-hand operation
- Large display includes A and B VFO frequencies and signal strength meter
- Battery Save function with Low Battery indicator
- Operates on 12 VDC external power
- 4 AA Ni-Cd batteries supplied, also uses standard AA dry cells
- BNC antenna connector
- Wide choice of accessories

### AR8600 Base/Mobile

#### **Think of it as a magnet for signals.**

- Temperature Compensated Crystal Oscillator (TCXO) ultra-stable frequency reference
- Coverage from 530 KHz ~ 2040 MHz\*
- Receive Modes: WFM, NFM, SFM, WAM, NAM, USB, LSB, CW
- New front end and RF stages for superior sensitivity
- 2 VFOs (A/B)
- 1000 memory channels (20 banks x 50 memories/bank)
- Alphanumeric channel labels
- Scan rate up to 37 channels/second
- Add up to 3 optional slot cards: Tone eliminator, CTCSS, Voice Inversion\*\*, Recording, External memory
- Accommodation for Collins® Mechanical Filters
- RS-232C port
- 10.7 MHz IF output (WFM mode only) can be used with SDU 5500 Spectrum Display Unit.
- 12 VDC operation
- BNC antenna connection
- Download free control software from AOR web site



The world's first VIDEO scanner • Tunes in to everything but cell phones • Wireless video monitor - excellent tool for surveillance

# The sky's the limit.

"It [IC-R3] is perfect for general monitoring or testing purposes in the shack as well as portable and mobile ATV applications such as R/C, finding downed balloons and rockets and public service events. This receiver is also very handy for repeater owners to track down interference from legal and illegal Part 15 transmitters or other services too. It does surprisingly well for viewing in bright sun light too."

-Tom O'Hara, W6ORG, of PC Electronics in  
Amateur Television Quarterly-Spring 2001

"The IC-R3 communications receiver is more than just another scanner. With live video reception of broadcast and amateur television, and short range RF-based video systems-Icom opens up a new frontier for the progressive wide spectrum scanner enthusiast."

-QST, 2/01



## IC-R3

### World's First Audio/Video Scanner!

Never before has this much excitement been in the palm of your hand. The IC-R3 brings you more than the usual audio you get from an ordinary scanner. Wide tuning range allows you to see and hear the excitement behind the scenes. Large easy to read color display for frequency settings and video reception. All in a compact easy to carry package.

Whether you're a hobbyist wishing to go beyond regular voice communications or a professional who does wireless video security or counter-surveillance - nothing else comes close to the 'R3 in price or versatility. Clearly, the IC-R3 represents a quantum leap in monitoring technology.

#### Here are just a few of the many video signals to monitor.

- 420-440, 902-928 & 1240-1300 MHz: Amateur TV frequencies
- 902-928 MHz: Part 15 video equipment; "VCR Rabbits"™ & wireless security cameras
- 2150-2162 MHz: Omni-directional transmission of point to multipoint video signals

Frequencies courtesy of Scanning USA, Feb. 2001 -Something new to monitor, by Tom Filecco



Limited time offers.  
See dealer for details.

0.5-2450 MHz† • 450 Memory Channels with Alphanumeric Names • CTCSS with Tone Scan • 4 Level Attenuator • Telescoping Antenna with BNC Connector • Four Way Action Joystick • Lithium Ion Power • and a 2" Color TFT Display with Video/Audio Output

Limitless uses • The world's first audio scanner/pocket TV combo

†Cellular frequencies blocked; unblocked versions available to FCC approved users. ©2001 ICOM America, Inc. 2380 116th Ave NE, Bellevue, WA 98004 425-454-8155. The ICOM logo is a registered trademark of ICOM, Inc. All specifications are subject to change without notice or obligation. R3MT701

See what you've been missing

[www.icomamerica.com](http://www.icomamerica.com)

  
**ICOM®**